Telephony.

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Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephone

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W. H. Graffis, 2d Vice-President — H. D. Fargo, Secretary-Treasurer

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Advertising of the Kind that Pays.

This is too late a day to sound the praises of modern advertising, for even the most conservative corporations and institutions in the world have been driven by changing conditions to recognize the compelling force and value of publicity. With commodities which are already highly popularized, however, there is sometimes a tendency to live on acquired reputation, and this is particularly true in the telephone field among managers who have never felt the power of advertising in stimulating new business and retaining established custom. The telephone has become indispensable and thus familiar to the public, in thousands upon thousands of applications; but few, if any, communities may be said to have reached the point of saturation, and the industrial uses of the telephone are far from developed, considering the possibilities. Thus, in the erection of lofty buildings and monuments, there is a much wider opportunity to utilize the telephone in connection with signaling operations from points out of reach of the ground than has as yet been fully realized. Both the speed of the work and the safety of the methods of construction can be much increased by connecting the upper parts of a structure with the street below, instead of trying to rely too exclusively upon the whistle or flag signal. In the shop a great deal of running to and fro can be saved by the telephone, as everybody knows, and yet the installation of intercommunicating sets is rarely carried through upon a basis that is sufficiently liberal to enable the company to enjoy the maximum possible time-saving benefits. It will pay the industrial manager well to figure out the value of time saved against the annual charges upon the additional investment necessary per station to bring his departments and sub-departments into closer mutual and executive touch. Again, the value of the extension set in the private residence in proportion to the cost of maintaining and renting it needs to be brought home in more senses than one.

What we need to do in advertising the telephone is to hammer away in a few telling sentences upon specific uses which save time and money, and to present, if possible, each application in a manner which cannot help arouse interest and attention. Some of the work now being done in this line is suggestive. One company is endeavoring to increase its toll traffic by extensive newspaper advertising, and it does this in a striking way by calling attention, not

to the general value of this service, but to its specific usefulness between cities whose names are given. Thus, the company states that a trip between two named cities costs so much money *by telephone*, giving the three-minute rate, and the number of words which can be counted upon in an average conversation of this length, and touching upon the time saved by avoiding a trip by train or otherwise. The point is that the uses of the telephone are so numerous that in advertising it a much better impression is made by confining one's copy to specific and short statements, and varying those from time to time, in place of trying to cover the whole field in any one advertisement, and spreading out so thinly that little, if any, good is done.

A live manager can depend upon even the incidents of an ordinary week's business to furnish him with suitable texts for advertising. Incidents where the telephone is the means of saving life and property are so numerous that, with the names suppressed, their local effectiveness may be turned to much advantage in securing new subscribers. A little thought expended upon this matter will pay good returns upon the effort required to pick out the striking and original aspects of telephone service.

Bluff vs. Intellect.

Once upon a time—all good fairy tales begin that way—the Home Telephone Company decided to put down conduit and sent to Metropolisville for an expert. Now, the expert was just out of "Tech" for a year or two, but he was a smooth proposition, who knew the value of an impassive countenance and a closed mouth. So he drove through the streets of Jaytown with the Home company's electrician, who had only been a telephone man for a little matter of twenty years, looked wise, and expressed the opinion that excavation in This street would show sand, and excavation in That street would be rocky. "He's a wonder," said the Home company's man afterward, "just by going through the streets, he could tell what the digging was going to be. Isn't it marvelous?" You bet it was marvelous—that he could get away with it.

There is a man who is a Plant Potentate in a Big Company, who years ago had the reputation of being able to promenade through a street and decide how many ducts of conduit would be needed in that street for the next generation. All this without development study or brain fag. Just like Madam Pazaza reading your palm. This is not quite so marvelous when you analyze it for, were four or five ducts decided upon, almost any size cables could be installed up to possibly eight hundred pairs per duct, and that ought to hold almost any street for a while. Then again, when the conduit was outgrown, the bluff and who made it would be forgotten.

As "a prophet is without honor in his own country," so the expert from afar is looked up to with open mouthed wonder, while home talent and the experience of years are passed slightingly by.

We knew a service inspector once, who was a good bluffer. One day he had to make a service inspection in a small town. The day was hot, the village inn was cool, the beer was good, there was the telephone list. Why walk or worry? He set down a hundred imaginary interviews with prominent citizens, and, after a good day's rest, returned home. Now, in the regular course of routine, this would have gone all right. Unfortunately, he made one of his subscribers complain of an apparatus difficulty just to give local color to the report. The Plant Department sent an inspector to make repairs and the instrument was found to have been taken out some weeks before. Then the service inspector fell down on his foolish face, just as most bluffers do in time.

Brains are better, but pity 'tis—they're cheap, particularly in the service of corporations. We once heard a boy—man, he called himself—in a technical school say, "When I graduate I shall not start in at less than $1,000 a year." Lots of technical men think they are lucky to get that in five or even ten years. Young men should not attempt an education with the idea that it means dollars. Any bootblack, if ambitious, brought up in the hard school of life, will probably beat him out at thirty. An education means a development of ourselves, the bringing out of the ability to enjoy refinement in people and surroundings. It means a greater capacity for enjoyment and, possibly, for sorrow. But it all tends to the ultimate human good and uplifting of the race.

Bluffs finally get called, they meet their match in time. You don't have to do the man who does you. Just wait, someone else will do him, consciously or unconsciously, for you. Brains will come out on top, but it takes a long time. The men from Missouri are getting the good jobs more and more every day. If you work for one you are lucky, for you cannot bluff him, he has got to be shown.

Some Elements of Telephone Photography.

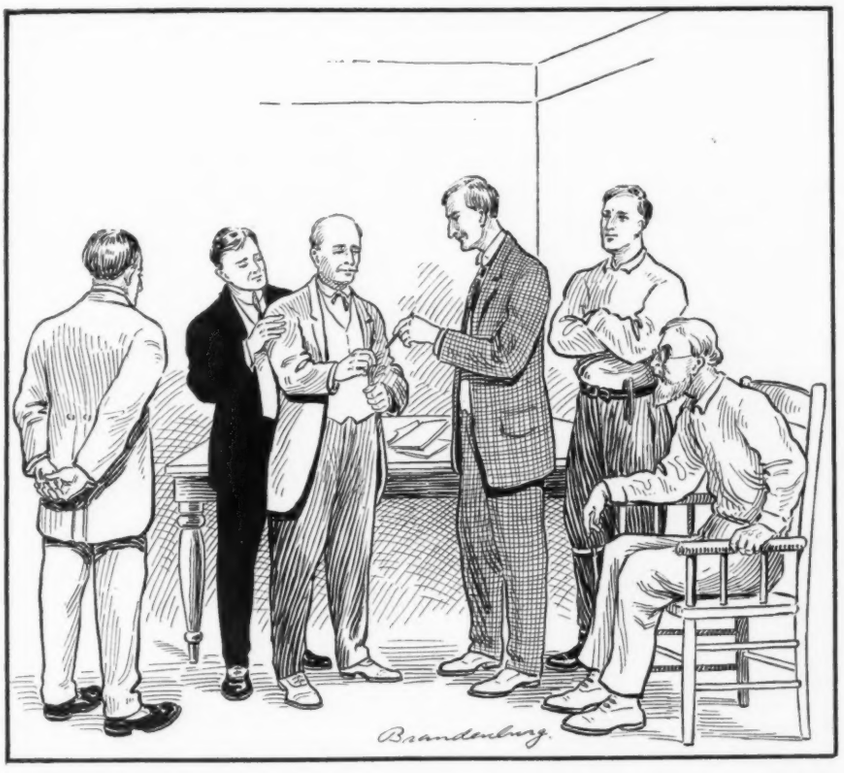
A few years ago it was hard to find a telephone man who was a camera enthusiast. Now we very frequently receive letters from men who use the camera, and our pages from week to week show the excellent results which they achieve. It is a fact that when a professional photographer attempts to take pictures of telephone construction or equipment, he usually scores a failure. He lacks the point of view which one must have to bring out the essential elements of a picture which may be used to show wherein the work is good, or reveal its weakness.

Today the aggregate of time which has been spent upon drawings for so-called standard specifications would represent an enormous total if it were figured up and rated at a reasonable value. Yet the only practical use which has been made of the camera, as a matter of custom, is the photographing of scenes of accidents which are the basis of suits in the courts. It may appeal to some of our readers that photographs of standard construction, taken from different points, would have a practical value greater than mere drawings. The drawing shows how the thing should be done. A photograph of a well built corner pole would show not only that it could be put up right, but that somebody has done it. The advantage would be, although less in extent, essentially the same in character as that which differentiates a working model from a collection of patterns.

The Man With the Belt and Spurs and the Property Owner

By Joshua Wilkinson

From the time the fundamental patents expired in 1893, up to late 1907 we have an epoch of steadily cumulative expansion in the history of the telephone. In a little more than ten years, under the stimulus of competition, the industry increased from a development of 250,000 stations to one of about 7,000,000 stations. The original development was confined almost exclusively to the larger cities, therefore this great gain was made to a large extent in the smaller cities, villages and rural districts. Thus we can understand what a vast amount of construction must have been necessary, not only to connect these millions of subscribers to local exchanges, but also to interconnect the cities, villages and rural communities into long distance systems. Hundreds of thousands of miles of pole line, and actually millions of miles of circuit were put up in this decade of expansion. Armies of men were employed in this work from one end of the country to the other.



An Honest Man Took Two Straws of Unequal Length and a Long, Lean, Lantern-Jawed Yankee "Drew Cuts."

In all armies some of the recruit fail to reflect credit on the cause, while others make good. In the telephone army we have veterans of both kinds left, although the former are gradually dying off through ill-repute. But every now and then we run across one who dies hard. Once in a while the construction foreman gets a chance to shake hands with an old knight of the belt and spurs—the kind that was in his glory five or six years ago. In those days all the lineman had to do when he fell out with the foreman or "got in wrong" with the crew was to quit, light out for another town, near or far, according to his fancy, and strike a new job. Then they were hiring any lineman who could climb, tie in, and keep up with the crew. This condition developed a care-free, happy-go-lucky, devil-may-care sort of a free-lance knight of the belt and spurs. Courtesy and character were minor or negligible qualifications.

Unfortunately the property owners got acquainted with crews made up of this kind of men; and since first impressions are lasting, telephone construction crews are not as popular with property owners as they should be. The man with the shade tree is usually the man with the gun.

The stress of much work to do in a short time, and the necessity of keeping within the estimate and within the demands of standard specifications did not give the foremen in those days much lee-way in time or in money to deal diplomatically with the property owner. Also, the fact that both the foreman and the lineman were here to-day and gone to-morrow made them very much less particular how they left the property owner. They never had to see him again. Their interest in the company seldom went beyond the next pay-day. Therefore the outcome in dollars and good will attending the final settlement for damages occasioned by their misdemeanors was rarely considered other than in the light of a joke.

But those days are gone, and the old scout who cannot adjust himself to the newer conditions cannot get a job with an up-to-date foreman. To-day the foreman and his crew are as much and as permanently a part of the "organization" as the manager himself. They should be, and usually are, as much interested and as responsible in their way for the policy of the company as is any other set of employes. They come frequently and importantly in contact with the public. Many people get their idea of the company from the actions and appearance of the men who work on the company's lettered wagons. Let the foreman who is building or repairing a line and who wants a favor from a property owner act in a fair, business-like, gentlemanly way and take the first "No!" in a polite, respectful and good-tempered manner and in the end he not only usually wins his point but earns his salary in good advertising for the company.

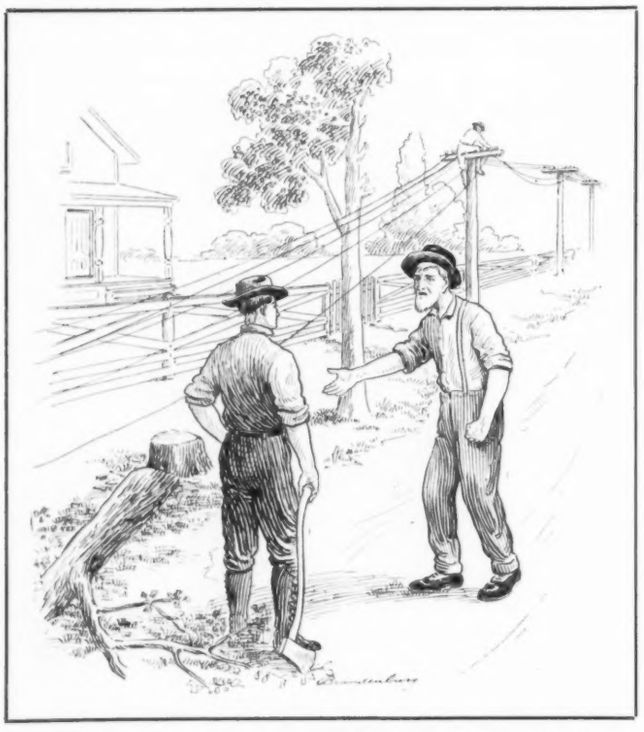
"I tell you," says the property owner, "the telephone company is careful who it hires; that fellow was a gentleman—the way they ask you makes you feel as though you would like to do something for them!"

There was a day when the telephone companies used to hire "right of way" men and "adjusters." One told the foreman where to do the mischief and the other paid for

it. To-day the foreman tells the linemen where not to do mischief, and where they absolutely must do it, he settles by giving the property owner a telephone six months on trial. The man keeps the telephone, pays for it and lets the company cut more trees to improve the service!

In regard to its construction crews the small company has an advantage over the big one. Much of the construction and reconstruction work of the latter is done by a state organization. But the gangs of the big companies are now very explicitly instructed regarding the reputations they shall leave behind them; still, even ironclad rules cannot provide that personal responsibility which must come with the knowledge that we will be there when the final day of settlement arrives. When strangers deal with strangers there is bound to be a certain amount of reserve and suspicion on both sides; the local foreman of a local and well-liked company has the advantage of frank and hearty co-operation. Yet the big companies are adopting divisional construction organizations, and instead of importing entire crews they are sending in foremen who hire local men. As the business ages it becomes less difficult to find experienced construction men in every community.

It is natural on the part of every good construction foreman who is held responsible chiefly on the cost and character of his work, gradually to lose sight of every consideration excepting the quality of his line. A man should take pride in his work. But too much must not be sacrificed even to quality. A long stretch of line straight as an arrow is a sight to gladden the heart of any telephone man, but if you have to cut down a hundred dollars' worth of shade trees and incur the ill will of a neighborhood to get a mile of poles in a straight line, you are allowing



Cutting Down Shade Trees, Incurring a Neighbor's Ill Will to Get a Straight Pole Line, Shows That Artistic Temperament Overshadows Common Sense.

the artistic temperament to overshadow common sense. The foreman of the big company is the one most likely to err in this direction. The writer has in mind a case directly illustrative.

A foreman was building a twenty-five foot, ten-pin, farmer and toll-line lead northeast of Dover, Maine. Half a mile of beautifully straight line approached a certain little cross-roads village where a corner had to be made. On the side of the road appropriated by the foreman for his line there was a neat little white cottage, with a row of symmetrically spreading maples in front. The foreman obtained consent to "trim just the ends of the limbs." Then the man who owned them hitched up and went away to buy cattle for a few days. When he returned there was a very straight telephone line extending in two directions from the village green, but three of his maple trees were almost completely stripped of limbs on one side, and the fourth tree was cut off close to the ground and carted away bodily. The foreman could have made a dozen double corners for what it cost to settle, and the man thought deep dark thoughts long after he had forgotten the price.

Here is another case with a different ending:

A local company was building the same kind of a line in the foot-hills of the White Mountains. The foreman came to a little New Hampshire village where the single street was beautifully arched with elm and maple foliage. Instead of trying to hew his way ruthlessly, the foreman called on the property owners individually, with his hat in his hand, asking for signed permissions to build his line through their back-yards. They saw the point, but wanted to know the reason why he shouldn't build the line through the back-yards of the neighbors across the street. There was no reason, so the foreman asked the neighbors across the street. They, too, saw the point, but also wanted to know why *they* were elected. Then the Solomon-wise foreman, as patient and polite as you please, got accredited representatives of both sides together and held a caucus. An honest man took two straws of unequal length and a long, lean, lantern-jawed Yankee "drew cuts"! After convincing themselves that the draw was unbribed, the elected side took defeat gracefully. But down at the end of the street there was a hard-headed farmer who owned hayfields instead of back-yards on both sides of the road. He said they could cut the trees, but he'd be hanged if they could set posts in his hay. The villagers were heartbroken, for they took as much pride in his shade trees as they did in their own. Almost any human foreman would have expressed sympathy and chopped down the trees, but this foreman had fifty dollars in stock in the company. He had a little talk with the farmer about public spirited generosity, but the farmer said that sentiment didn't pay for hay.

"Why!" objected the farmer, "would you have me drive 'round them four poles with a plow, harrow, seeder, cultivator, mower, hay-rake, tedder, reaper—tramp down hay or grain? It would be a confounded nuisance!"

"All right," said the foreman, "let us get down to brass tacks and figure it out. You go around them only once a year; supposing it is hay, you go round them only once a year with the mower; it won't take you two minutes to the pole to stop and lift up your cutter-bar. You will lose a strip of hay land a foot wide and six foot long for each pole. That's four feet by six for the four poles—twenty-four square feet, less than the thousandth part of an acre. The best hay goes a ton to the acre—$6 a ton is a big price for uncut hay. Then in a hundred years you would lose sixty cents worth of uncut hay. In lost time you would be out eight minutes a year, an hour in seven and a half years, a ten hour day in 75 years. Counting your time with team at $4.00 a day you would be out for both hay and time about $5.00 in 100 years for letting us set those four poles in your field! You ought to be willing to spend that much every hundred years to please your neighbors!"

"But you haven't counted the hay they will tramp down every year fixing the line."

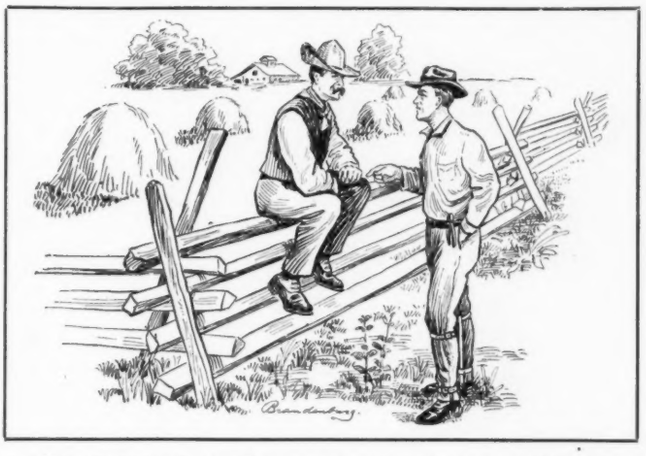
"We build our lines so good that they don't have to be fixed very often, and when they do it is usually at a time of the year when there is only snow and sleet in your hayfield."

"Well, they have to climb over the fence then and tear it down, don't they?"

"Last year our records showed that we had about fifty cases of trouble on our toll and farmers' lines outside of our village exchanges. We have 112 miles of line. That is less than one trouble to every two miles of line. We want to set one eighth of a mile in your field—this means that we are due only once every 16 years to climb your fence to fix the line. And as for tramping down your hay to fix the line, there is only two months in the year—and less than that—when we could injure your hay by tramping it down. Then there is only once every 96 years that we are due to tramp it down, and when you consider that possibly 75 per cent of our line troubles occur in the snow and sleet season, there is only about one chance in 125 that we would damage your crops by tramping them down. But if by any chance we should damage either your crops or your fence we would be just as anxious to please you with a fair settlement as we are anxious now to please your neighbors by setting this line in your field. You always know where to find us. Even now, to remunerate you in advance for any possible damage and as an appreciation for your kindness, I will put a telephone in your house six months free for the privilege of setting four poles in your field!"

To-day the poles are in the field, the farmer has been paying for his telephone for a year, and an extra circuit had to be run to take care of the extra subscribers secured in the satisfied village.

Hundreds of small Independent companies owe their success to their popularity with villagers and farmers. Tact and gentlemanliness in their construction men are more valuable than years of experience and expert technical knowledge. The managers of such companies, if they are capable, know that the elements of the ordinary lineman's trade can very quickly be taught to an ordinarily bright working man. In a week any competent foreman can teach the farmer's son to climb a pole, splice a wire, pull up and tie in. Crews made up of local men, and in charge of a common sense foreman, are not only much more economical but also a much better advertisement for the company than the imported and important kind, which swaggers through its work while it is in town and looks down upon country people from a superior height. There is a certain kind of a lineman who seems to feel, when he is on the top of a twenty-five foot pole, that he is about a mile higher up than the man who owns a tree or a good place to set a guy anchor! Such a lineman and especially such a foreman ought to be shaken off his perch and "canned" before he falls on the company's reputation.



A Little Talk With the Farmer About Public Spirited Generosity but the Farmer Said Sentiment Didn't Pay for Hay.

Some Comments on the 1908 Annual Report of the A. T. & T. Co.*

By Gansey R. Johnston

The functions of the American Telephone & Telegraph Company are recited in the report as being primarily those of a holding company, as an operating company for the long-distance lines, as a centralized general administrative company for all of the associated companies. In this last capacity certain advantages are listed, which we may briefly consider.

For one, the A. T. & T. Co. "owns and maintains all telephones." This, in the judgment of Independent telephone men, has been made a heavy and needless burden upon the associated companies.

It "owns directly or indirectly all patents." This is to the advantage or disadvantage of the associated companies, according to the value of the patents, or their use by these companies on an economic basis.

The Engineering Department of the A. T. & T. Co. develops new ideas in construction and operation. The value of this department depends upon its administration. It is stated of every matter which has come before this department that, "when settled there it is settled for all." In the minds of many such a system tends to lack flexibility for a growing business. "It is safe" (for the A. T. & T. Co., perhaps) "to say that there has as yet been no instance where any invention, system, or method rejected by the Patent and Engineering Departments of the American Telephone & Telegraph Company ever had any permanent success when used elsewhere." Such an expression as this marks the delusion into which all governing bureaus, and particularly all monopolistic bureaus, are almost certain to fall. It is possible that inventions, systems, and methods which have found permanent success in other service have been rejected, not by the Patent and Engineering Departments, but by those financially responsible for the costs of change and improvement—costs which might be enormous over the large system.

The Manufacturing Department creates and builds the equipment and apparatus, and thus establishes standardization and uniformity. This, it is said, is not any handicap on improvement or development of the art, for every suggestion or idea has abundant opportunity to be tested. This expression forgets that not every suggestion or idea presented to the telephone field gets to the Bell interests at first hand and neglects the consideration that an opportunity to be

*Concluded from issue of August 14, 1909.

tested or a test does not necessarily involve adoption upon merit.

There is a legal department which looks after the legal questions which affect the telephone business, and the administration generally looks after the questions between the companies and their policy. Telephone legal questions, outside of the monopoly questions, have not been particularly oppressive.

How do these advantages as recited for the centralized general administration of the A. T. & T. Co. compare with the claims for centralized administration of monopolized manufacture? They omit these considerations:

Economy of manufacture on a large scale.

Economy of sales and advertising.

The reduction of stocks.

The guard against overproduction.

The running or closing of each plant economically according to the demand.

The saving of cross-shipments.

These are not applicable to the telephone business. Other considerations which are not mentioned, but which are applicable, are—

The monopoly opportunity in rates and profits.

The better access to the security market.

One side of centralized administration (which the Bell organization has not escaped) was the subject of comment in the last message of President Cleveland:

"Such occasional results fall far short of compensating the palpable evils charged to the account of trusts and monopolies. Their tendency is to crush out individual independence and to hinder or prevent the free use of human faculties and the full development of human character. Through them the farmer, the artisan, and the small trader is in danger of dislodgement from the proud position of being his own master, watchful of all that touches his country's prosperity, in which he has an individual lot, and interested in all that affects the advantages of business of which he is a factor, to be relegated to the level of a mere appurtenance to a great machine, with little free will, with no duty but that of passive obedience, and with little hope or opportunity of rising in the scale of responsible and helpful citizenship."

Great matters sometimes turn on little pivots. The Engineering Department has as a working premise in its studies of development, if I am not misinformed, the assumption that there will be no competing company fifteen years hence. It works also on the assumptions that telephone rates and telephone demands can be forecast by minor localities, if not block by block, for a like period. It is easy to perceive that a very little multiplying of fundamental errors might overreach all the savings of a centralized engineering force.

POINTS OF COMPETITIVE DIFFERENCE.

The contest between the Bell interests and the Independent interests presents itself in two general phases. One is that of controversy, public and private, in which is embodied more of bitter feeling than of judicious and honest statement and study. The other is the side of competent, genuine difference of opinion as relates to the true character of the telephone business. Unfortunately the former is somewhat exemplified in this annual report.

There has been much of spiteful language used in telephone controversy, and many underhand attacks of each competitor upon the other. It is beyond reasonable expectation that competition will be based entirely upon frank, fair and truthful statements. It is generally true, however, that contestants prefer a fair fight, and will follow a leader in the direction of fairness.

The President of the American Telephone & Telegraph Company has an opportunity, in his control of the associated Bell companies, of lifting the controversy upon a higher plane, if only he will choose that course.

In respect to their business policy, concerning which there may properly be differences of opinion, there are two primary divisions between the Bell interests and the Independent interests. The former stand for monopoly and the latter for competition in the telephone business. The former stand for high rates for service and the latter for low rates.

In the 1908 annual report, there is not so much of argument in favor of monopoly as in the report for 1907. The principal expression is the quotation from last year's report as follows:

"Two exchange systems in the same community, each serving the same members, cannot be conceived of as a permanency, nor can the service in either be furnished at any material reduction because of the competition, if return on investment and proper maintenance are taken into account. Duplication of plant is a waste to the investor. Duplication of charges is a waste to the user."

Answer to this may be made in brief.

The competitive telephone companies do not propose that the two exchange systems in the same community shall serve the same members. They say that the service in both of two exchange systems, each serving a large and differing portion of the public to which one system is acceptable, and serving alike that smaller portion which has need for the maximum service, can furnish service at a material reduction because of the division between the systems, taking all necessary expenditures into account. *The plants which thus serve differing portions of the community are not duplicate plants. The greater part of a plant rented to telephone users is individualized for those users.*

Of the charges to duplicate users, very few are wasteful, in the sense that these users could expect to get an equivalent of service at a lower price; and none of them are wasteful in the sense that the user gets less than his money's worth. It has been the history of the business that where competition does not exist the users of whatever class have paid more than the competitive rate.

The ordinary argument for industrial competition does not rest upon any basis of material reduction in costs. It rests upon the basis of the effect of compulsion and rivalry upon human nature. One of the directions which this may take is the study of economy; but it may readily be admitted that competition may involve extra costs, without losing the reason for its being. At the same time it is contended that telephone competition does involve some material reductions in costs.

In TELEPHONY of November 7, 1908, were published some statements of comparative costs, showing the small degree of duplication in competing plants.

A recent count of telephone directory names of 34 cities in Illinois, Indiana, Iowa, Michigan, Ohio, Minnesota, and Nebraska shows the following totals:

Bell total	96,224	43.6 per cent
Independent total	124,012	56.4 per cent
	220,236	100 per cent
In both books:		
Business names	15,170	
Residence names	4,315	
	19,485	8.8 per cent of total.

The entire list is published in TELEPHONY of June 12, 1909.

CONSOLIDATION.

"There is now" it is said "a decided tendency on the part of the public to favor consolidations wherever there are two exchanges. A great difficulty in the way is that, as a rule, much of the duplication of the plant cannot be utilized for many years, if ever."

The first statement is as broad as it well can be in its expression of a *decided* tendency *wherever* there are two exchanges. If this is true, or approaches truth, it has escaped

the observation of the Independent interests. If the duplication of plants has ever stood in the way of consolidations which other conditions favored, this also is news. If the Bell interests have ever in good faith made a proposal of consolidation of exchanges over any considerable territory under the alternatives of buying other plants or selling their own, it has not come to my notice.

Among other difficulties are the anti-monopoly laws of a large number of the states, if not the anti-trust laws of the United States. There are contractual and implied obligations. There are Bell objections and Independent objections. In some of these the objection is sentimental—of that class of sentiment which is well-founded and slowly to be overcome. The sentiment of dislike and distrust of opposition companies is not absent from the Bell company's annual report, notwithstanding the disclaimer of quarrel, while the Independent interests will be slow to forget that the Bell companies for some thirty years fought against their very existence. Beyond all this, at least in the present state of the telephone art, is the condition that consolidation in a very large number of cases does not mean either greater earnings or lower expenses for the companies, or for the large proportion of the public any increase in values commensurate with the necessary increase in charges. It is altogether questionable, in addition, whether it would be possible to finance any telephone consolidations on a large scale.

FORMS OF INCONSISTENCY.

The writer recognizes that any argument which fails to include all of its qualifications and exceptions as it proceeds is open to charges of inconsistency. But there is one inconsistency in phrase or in unimportant omissions, and another in matters of fact and of logic. That treatise which refers repeatedly to its own fairness and candor and only to the misleading and impossible statements of its opponent opens itself to attack upon both grounds. I have tried to put stress upon the second class, and to review only enough of these to make it plain that none of the expressions may be wisely taken at their face.

There is a business antagonism between low rates and high profits; between sale values and tax values; between economy and display; between building for assured income and building speculatively or for pride of possession. Remarks on one side of such business questions do not always give the other side its proper due. We conceive that it does not violate the rules of the game to set one such argument against another. Regard should be had, however, for the possibility of a middle course that avoids the extremes of either or both and which in a great number of cases, is more satisfactory.

We may agree that there are many Independent companies—with their separate systems and managements—which do run to extremes. We contend that the practices of the Bell companies—with their unified control and policies—average on the wrong side of the middle in rates, economy, construction, and adaptability, while different companies in different localities exhibit all the extremes that their controlling officer condemns in their competitors.

Central Office Locations*

By S. D. Levings

The work, which the previous articles assume to have accomplished up to this point, since completing the development study, may be summarized as follows:

1. Location of telephone center.
2. Location of central office site.
3. Design of central office buildings.

Except where specifically mentioned, all of the above work has been based upon the requirements for single office towns. It now becomes necessary to take up the question of towns requiring more than a single office, and to describe the additional work necessary in designing an economical arrangement of offices and distributing plant.

CENTRAL OFFICE LOCATIONS, IN MULTI-OFFICE TERRITORIES.

When the development study for the town in question is completed, the first point to be determined is the number of central offices required, initially and ultimately. The relation between the 10,000 line switchboard, and the area it is designed to serve, previously mentioned, was the forerunner of a rule for determining the number of offices required to serve a given number of lines. Therefore, to find the number of offices required, divide the initial lines, as shown by the development study, by 10,000, for the initial number of offices, and the line figures at any intermediate time, to ascertain the number of offices required at that particular time. If the number of ultimate lines is less than 10,000, the town is a single office town. If in excess of that number, it should be classed as a multi-office town, regardless of the number of offices required initially. Exceptions to the rule, in this work, are not infrequent, and when conditions present themselves, which will place the town in such a class as to be an exception, a special study will have to be made to determine the number of offices required at the various periods during the life of the development study. The present work is primarily intended to show the procedure to be followed under normal conditions, but where special features may be introduced to advantage, they will be so designated and discussed. It should be understood that the rules governing the location of exchanges where the automatic equipment is used differ from those involving manual equipment, but for the present manual equipment only, will be considered. It may be further pointed out that the present study is based on a territory in which no present plant exists. The existence of a plant already installed when one is determining multi-office layouts, often exerts considerable influence where such plant is available for part of the ultimate plant. Layouts involving the use of existing plant will be taken up subsequently.

The general outline of the procedure to be followed may be best summed up by dividing the work into divisions, covering the main subjects to be treated, and they are as follows:

1. Division of the territory into districts, corresponding in number to the number of offices required at the ultimate period.
2. Determination of the wire center, or telephone center, for each of the districts.
3. Location of the exchange site, actual for initial offices and tentative for future offices.
4. Design of floor plans for present office installations.
5. Design of the distributing plant, for cost comparisons.
6. Determination of annual charges, for the various plans.
7. Comparison by annual charges of the various plans.

Without further explanation it is apparent that all exchanges initially built should be so located as to become a logical part of the ultimate whole. Owing to this fact, the

*Continued from issue of August 14, 1909.

present locations are many times so located as to be erroneous, when compared with the theoretical location involving only the present territory. For this reason, larger expenditures in distributing plant for initial installations are many times necessary, than would be considered logical and economical for the initial territory involved.

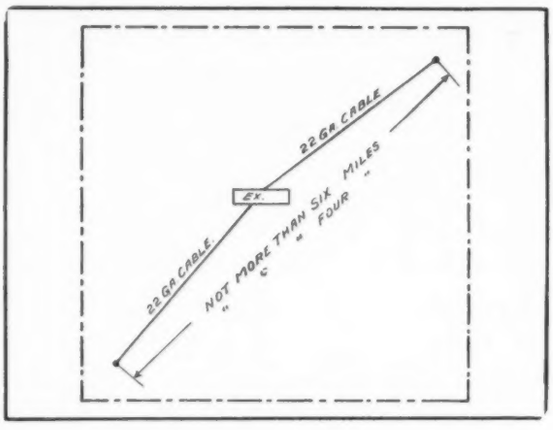


Fig. 17. Local Transmission Cable, Wire Size and Length.

Unless these causes for additional expenditures are known and recognized, false conclusions will frequently be reached, and particular attention is therefore called to the relation between the location for initial offices and the initial territory which must be observed to avoid such false conclusions. Preparatory to making the tentative plans, four white paper maps are needed, such as were used for the record map in the development study work. Upon three of these maps separate tentative plans should be laid out, one being reserved for the plan to be adopted. In order to make the theoretical lay-outs, the development figures must be used, and it is therefore necessary to copy on each of the four maps the present and ultimate line and station figures. To intelligently work out the theoretical studies, the factors which influence the division of territory and the design of the main portions of the distributing plant should be thoroughly understood.

The property of telephone lines which enables them to reproduce speech susceptible to comprehension is called their transmitting effect. This virtually means, that telephone lines are designed to carry the electric currents which, by means of the apparatus attached to the ends of such lines, reproduce sound. The clearness or articulativeness of speech which a telephone line affords determines its quality of transmission. Electrical calculations, together with experiments in voice current transmission, have resulted in several standards being established for the various kinds of telephone lines, such as local, trunk, toll lines, etc., and all lines must be so constructed as to furnish a transmission within the limits of the standard adopted for the particular line under consideration.

In towns of any size, telephone cable is the most economical method of distributing the wires from the central office to the various telephones within the territory, and when such cable, made up of wires of any designated size is used, there is a limit to its length, beyond which limit a grade of transmission cannot be obtained which will be within the standard. Therefore, the subject of transmission not only affects the distributing plant, as to size, etc., but directly affects the extent of the territory which may be served from a single exchange. This being the case, transmission is to be first considered as affecting the division of territory. Four grades of transmission may be properly considered in the multi-office territory, these grades and their uses being defined as follows:

1. Local transmission, a term the application of which is restricted to the transmission of speech currents between two subscribers' stations located within the same exchange district.

2. Trunk transmission, restricted to the transmission of speech currents between lines terminating in two switchboards not in the same exchange, when one subscriber in one exchange district is connected to another subscriber not in the same district by means of a trunk line.

3. Toll switching trunk transmission, which is restricted to the transmission of speech currents between the switchboards of the district exchanges, and the switchboard upon which the toll lines of the system terminate, when a subscriber in an exchange district is connected to a subscriber at a distant point, beyond the limits of the multi-office territory.

4. Toll line transmission, which is restricted to the transmission of toll messages within the multi-exchange territory, between the aerial toll lines and the toll switchboard.

The relation between the 10,000 line switchboard and the area which it serves has already been pointed out, and it has been determined that for all such areas, normal local transmission of a sufficiently good grade can be supplied when No. 22 B. & S. gage copper conductors in cable are employed. In considering the individual districts of the multi-office territory from the standpoint of local transmission, they are to be considered as self-contained units, and for this reason it may be said that all local transmission may be satisfactorily supplied by the use of No. 22 B. & S. gage conductors in cable. There is, as previously stated, a limit to the length of cable, both in the single office territory, and in the district of the multi-office territory, which limits vary. It is not practicable, at this time, to go into detail concerning the electrical calculations which have determined the transmission standards, and, consequently, the allowable lengths of cable. In all cases, the standard is determined from the electrical constants of the circuit under consideration. The limit, based upon the calculation referred to above, for No. 22 gage cable, in single office territories, has been set at 6 miles. The six miles may be either considered as being divided in the middle by the central office, thus allowing three miles of cable on either side of the office, or any combination may be designed such as two miles on one side of the central

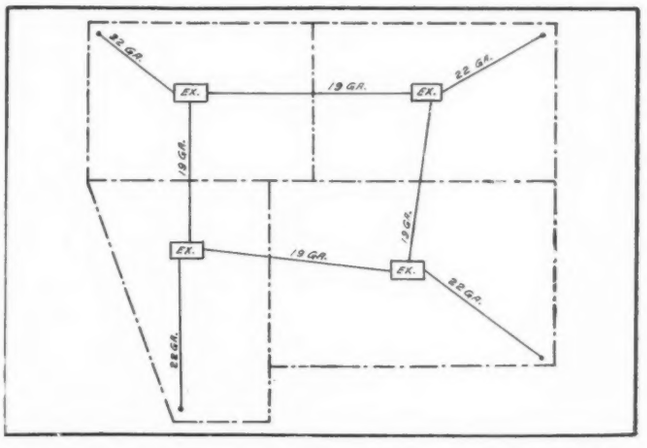


Fig. 18. Wire Size for Trunk Transmission, also Trunking Routes.

office and four on the other, but in any combination the total must not be greater than six miles. If the central office is properly located at the telephone, or wire center, it will usually divide the total cable length at approximately its middle point. In the single office town, no trunk nor toll switching trunk transmission is encountered.

In the multi-office territories, these two kinds of transmission are encountered, in addition to the local transmission, which tends to increase the resistance of the circuits when one subscriber is connected to another not in the same district beyond the resistance of the circuit supplying local transmission. This increase in resistance has made it necessary to both curtail the limits of 22 gage cable in the exchange districts, and to require a larger cable wire size for trunks. The changes thus made necessary will insure a transmission for inter-exchange communication equal to that of the single office town or exchange district. Therefore the 22 gage cable limit for exchange districts is usually reduced from 6 miles to 4 miles or less, being figured for each individual case, the combination of distances on each side of the central office being allowable in the same way as was explained for the single office town.

Upon the results of electrical calculations for the wire size to be used in the trunk cables of the multi-office cable plant, it has been determined that No. 19 B. & S. gage wire will furnish the desired standard of transmission when the subscriber most remote from the exchange in one district is connected to another subscriber most remote from the exchange situated in the district farthest from the one in which the first subscriber is located. It is clear that the trunk length between two adjacent exchanges, is determined by the area to be served from the switchboard in the exchange districts, coupled with the limitation placed upon the length of 22 gage cable. Thus if the maximum local cable length on one side of the exchange is 2 miles, the exchanges adjacent will be approximately 4 miles apart, and it will require 4 miles of trunk cable to connect the exchanges. This, then, determines roughly the minimum length of trunk cable. Only in the very largest cities is it necessary to increase the size of trunk cable wires for the maximum distances between exchanges, and for this reason it will be assumed that for the study under consideration No. 19 gage cable only need be considered.

In the same way as described above, the wire size for toll switching trunk cables has been determined to be No. 13 gage. When toll lines are carried in cable between the aerial wire lines and the toll switchboard, they are to be of No. 13 gage. The revenue obtained from the toll business is a very important item in plant earnings, and special precautions are taken to insure good transmission for toll messages. In the larger cities, it frequently becomes necessary to provide for better transmission than can be furnished by the No. 13 gage toll switching trunks, and toll lines in cable. When this is necessary the cable is loaded. Loading of cable requires an extended discussion, and on account of the limited space available at this time it will have to be neglected. For this reason No. 13 gage cable only, unloaded, will be considered for these portions of the distributing plant.

The best method of illustrating the uses of the various wire sizes just described is the use of diagramatic plans, and the following diagrams illustrate the various combinations of wire sizes. Fig. 17 illustrates the wire size for cables furnishing transmission for single office towns, and for local transmission within exchange districts of multi-office territories. The limiting lengths for both areas are indicated. Fig. 18 shows the wire size to be used for trunk transmission, and shows the route of a message in cable, when one subscriber in a district is connected to a subscriber in another district. Fig. 19 shows the wire size for the toll switching trunks, and for toll lines in cable. It shows the route of a message in cable, when a subscriber in any of the districts is connected for making a toll call.

The cable required for the various purposes just described is the basis upon which the annual charge for the distributing plant is determined. There are other portions of the distributing plant which are always present, but for the purpose in hand such portions need not be considered. The reasons for thus neglecting them are based upon the following assumptions: First, the cable portion of the plant is the most costly, and any appreciable saving in cable in one plan over the other can be taken as a sure indication that the plan involving the minimum amounts and sizes of cable will be the most economical from all standpoints. Second, where cable is required, either conduit for containing it or pole lines for suspending it will be required, and the amount of such conduit and pole plant is in direct proportion to the cable plant. Therefore, the relations between the cable plant and the other portions of the distributing plant make it possible to consider only the cable plant. This final assumption completes the information concerning the distributing plant necessary for the purpose of comparison, to determine the most economical arrangement of districts and plant in multi-office lay-outs. The remaining plant to be considered, for annual charge comparisons, is the apparatus contained within the exchange building.

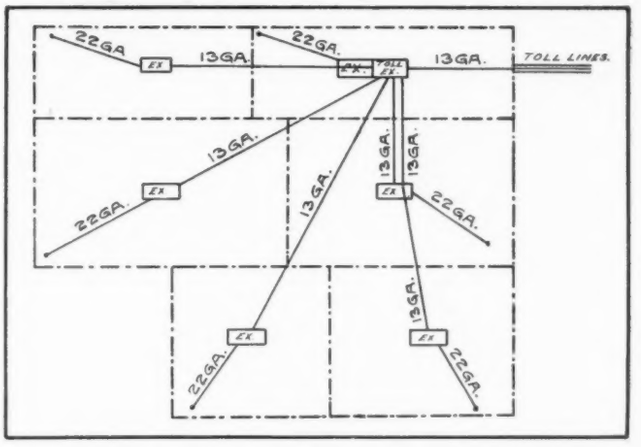


Fig. 19. Wire Sizes for Toll Switching Trunks and Toll Lines in Cable.

(To be Continued.)

Bees in a Cable Box.

The following from the Ashtabula, Ohio, *Beacon Record* shows that while a lineman's life is not always filled with joy occasionally considerable honey may be found.

"On a recent day, when a lineman of the Ashtabula Telephone Company opened a cable box on the pole at the corner of Elm and Henry streets, a swarm of bees issued from the box and buzzed about his head so that he quickly slammed the box door and, beating off the would-be stingers, escaped to the ground unhurt.

"Tuesday Lineman R. L. Bailey of the same company scaled the pole, smoked the bees from their lodging place and gathered 12 quarts of honey from the enclosure. Bailey likewise escaped without being stung.

"The bees had evidently been in the box all summer, for they had laid up a considerable store of wild honey and the present is a poor honey season as such go. There were a good many of them, and where they went when smoked out by Bailey is not known. They may possibly return to the same box.

"It has been known that bees occasionally populate cable boxes on telephones, but this is the first case, so far as recalled, which has occurred in Ashtabula."

Handling Trouble*

By J. P. Boylan

The maintenance of switchboard apparatus, line and substation equipment in a manual telephone system is so closely allied to the actual traffic conditions, that it has been found advisable in large companies to have these two divisions under one head. The varied reasons which lead up to this conclusion, and the fact that most operating companies have

HT 62

The Home Telephone Company of Detroit

Troubleman.....

Was at .....

at .....M., ...190....

for the purpose of.....

and found premises closed. Should further attention be required, please call the "Trouble Clerk."

Card Which Troubleman Leaves in Cases Where Subscriber is Not at Home.

adopted this plan in their line of organization, are in themselves the best arguments in its favor.

The one effort of the telephone manager is to have as low a maintenance expense per telephone as possible, consistent, of course, with the prompt and proper repairing of trouble. There are many ways in which this can be accomplished. In the writer's opinion the best and most economical course to pursue is to continually anticipate trouble, bringing it to light by persistent inspection of exchange apparatus, cable boxes, aerial lines and substation equipment. In this manner many scrapes, cutouts, etc., are discovered and before any irregularity can become prominent enough for the subscriber to note and complain of it, it is detected and regulated. A natural result of this would be a more contented lot of subscribers, and a better and more economically maintained plant.

Another good practice along this same line is to make a nightly voltmeter test from the last section of the multiple on all subscribers' lines, also a talking and ringing test of all switching cords and trunk lines between exchanges. This can be done by the operating force without added expense, on account of the traffic being light during the small hours of the morning.

The aim of the telephone engineer of today is not alone confined to constructing a plant so as to experience a minimum amount of trouble, but also to provide ways and means to quickly detect the existence of trouble, and to install apparatus to facilitate the testing and clearing of it.

With the old magneto system the telephone company relied in a great measure on the subscriber's first detecting and reporting trouble on his line, but a big improvement in this respect was brought about on the advent of the common battery switchboard, because a sleeve ground or short circuit on a line would bring in a permanent signal, thereby giving the operator an automatic report—so to speak—of the trouble.

It only remained, therefore, for the telephone engineer to devise some method of notifying the operator of a tip ground which, while not bringing in a permanent signal, or preventing a subscriber from calling the exchange, would nevertheless result in false "Don't Answer" reports caused by part or all of the ringing current going to ground. In some instances this trouble makes the line more or less noisy. This is one of the most aggravating troubles which has annoyed the telephone manager, for the reason that the operator had nothing to indicate to her that trouble existed. The old saying "A disease once known is half cured" can well be applied to any such case of unknown or intermittent trouble.

The "Don't Answer" irregularity has recently been adjusted by the use of a protection relay provided in the ringing circuit, instead of using the ordinary resistance lamps or coils. This relay is equipped with a double winding; one being a non-inductive and the other an inductive winding. When the ringing current is employed on a clear line it operates through the non-inductive winding, but when there is a short circuit or ground on the line which shunts out the resistance of the substation telephones, the inductive winding of the protection relay is brought into play, pulling up the armature and cutting in sufficient resistance to prevent a dead ground of the ringing circuit. When the relay is operated an extra set of springs on a local circuit causes a pilot lamp to light in front of the operator, which indicates to her that the line she is calling is out of order.

Another feature which facilitates the handling of trouble, perhaps more than any other, is the installation of an out of order cord system. The circuit originates at the wire chief's desk, where a jack and two lamps (white and red, respectively) are installed for each line. It terminates at the last position of the switchboard, where there are mounted cords and plugs, one each to correspond with every set of signals on the wire chief's desk.

A permanent signal coming in at any hour of the night

Form HT 66

TROUBLE TIME SLIP

DATE.....190.... DISTRICT NO.....

TEL. NO.	LOCATION	MIN.	TROUBLE FOUND	CAR TKTS.
	TOTAL			

TROUBLEMAN

ENTER MATERIAL ON OTHER SIDE

The Troubleman's Daily Trouble Slip Upon Which He Records the Cases of Trouble Telephoned from the Office.

can immediately be plugged out at the end position by the operator in charge. As soon as this plug is inserted in the multiple, an "out-of-order tone" is put on the line, so that any operator testing a line so plugged will recognize the tone and report accordingly to the subscriber. An order wire is generally used during the day time, so that any operator

*A paper presented at the Annual Convention of the International Independent Telephone Association, December, 1908.

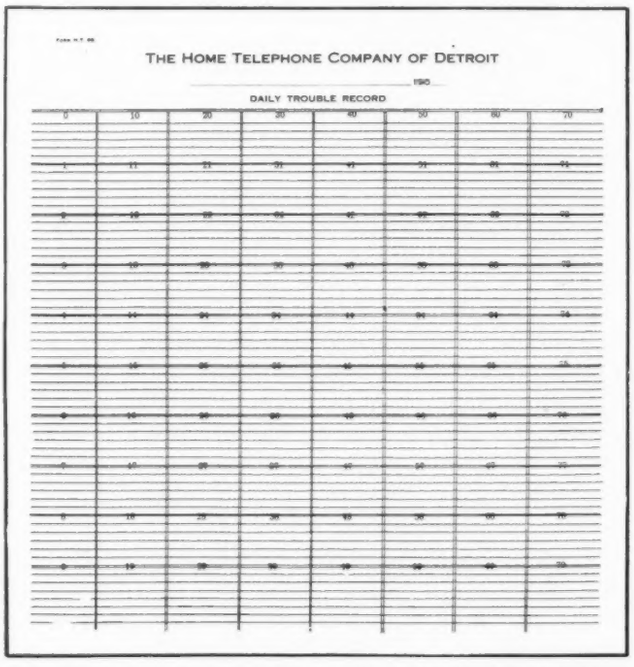
can report a permanent signal to the trouble operator located at the end position, who, when inserting an "out-of-order cord" in the multiple puts out the line signal, after which she reports the line and out of order cord number to the wire chief by order wire. As soon as a line showing a permanent signal is plugged with an out of order cord both signals associated with such cord will light on the wire chief's desk. When the line is cleared the upper, or red signal will go out. The wire chief is provided with an order wire to the trouble operator by which he orders up test cords and orders down out of order cords.

Another advantage is gained by these out of order cords from the fact that troublemen, when working on a line, are able to operate signals on the trouble desk which can be answered immediately by the wire chief, thus saving the troublemen much time which they otherwise would be compelled to spend in calling in over another line to get a test.

The wire chief's subscribers' lines are multipled on the monitor's desk in the operating room, so that, by operating a switch at the wire chief's desk, the calls can be promptly answered by the trouble operator at night without transferring.

No set rule can be outlined for the arrangement of troublemen's districts. The physical condition of one district may differ materially from that of another, as may also the number of telephones per square mile. The general average, however, in large cities is about 1,000 lines per troubleman. Where several troublemen are employed the best results have been obtained by having them receive and report back on all trouble by telephone. This will mean the saving of time in keeping them in their districts, it being only necessary to come to the office for material, etc.

As the troubleman receives each case by telephone, he enters it on a daily trouble slip, and from these trouble slips the daily trouble report is made. The permanent record of trouble, however is maintained on the subscribers' cards, which are arranged numerically at the wire

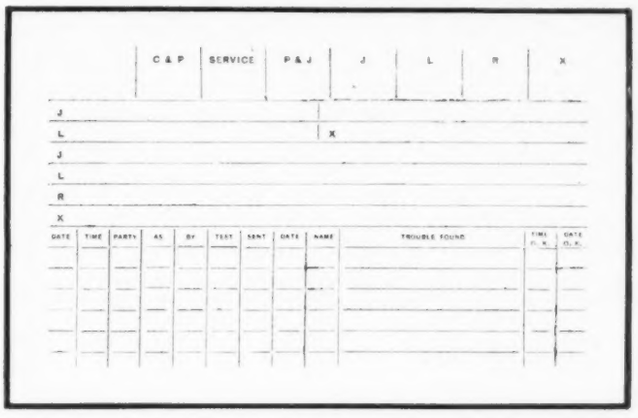

THE HOME TELEPHONE COMPANY OF DETROIT

DAILY TROUBLE RECORD

The Daily Trouble Record Upon Which all Trouble is Entered as Soon as Reported.

chief's desk. In some cities a trouble slip only is used, and after trouble is cleared these slips are filed numerically in open envelopes. The card system is considered the best, because a slip can easily become lost and would never be missed. Then again, the card will show up at a glance all cases of trouble which repeat, and this is especially valuable information to the wire chief, who would note such a condition while writing up the last case of trouble on the card and take steps to remedy it.

I want to emphasize here the importance of entering every case of trouble, however trivial or no matter if it comes in and clears in a few moments, on the trouble cards.



Subscriber's Card Upon Which a Permanent Record of Trouble is Kept.

If this is done the wire chief's attention will be called to the fact that Mr. So and So leaves his receiver off the hook a great deal, which fact being called to his attention, he will unquestionably be glad to correct this fault. It is possible also that the line may swing to ground or short circuit in windy weather; but if every instance of trouble is reported, the wire chief in going over the cards will notice that something is wrong and will order an inspection of the line which will bring to light the intermittent trouble mentioned. Thus the importance of insisting on every mechanical irregularity, whether it tests O. K. after it is reported or not, being entered on the subscriber's card.

When a case of trouble is reported it is entered on the daily trouble record. It will be noted that this printed form is arranged similar to the numbering of a multiple, there being a block of spaces for each 100 telephone numbers. This permits the wire chief to immediately tell whether a certain telephone number has been previously reported, and will also enable him to give a prompt reply to an information call regarding a line in trouble. The subscriber's card is then taken from the file, and the first six vertical columns on the lower part of card filled in. It is then placed in the pigeon hole of the trouble district where the line is located, awaiting the troubleman to call in. After the case is given out the 7th, 8th and 9th columns on the subscriber's card are filled in, and the card is transferred to a pigeon hole just below the former one. There are two pigeon holes for each district; one representing trouble to be given out and the other trouble which has been given to troubleman.

When the line has been cleared, the last three columns are filled in by the wire chief, and the card placed back in the subscriber's file.

Beginning at the top of the subscriber's card and reading from left to right are spaces provided for the following: Telephone number; cable and pair; class of service; panel and jack; style of set and date installed for each of four-party line subscribers; location of terminal or cable pole where each of four-party line subscribers is connected; space for names and addresses for each of four-party line subscribers.

The vertical items heading the record of trouble are as follows: Date trouble was reported; time reported; letter of party-line subscriber in trouble (if the entire line was out of order the notation "all" would appear); the nature

of trouble; result of wire chief's test; time given to troubleman; initials of troubleman; trouble found; time O. K.'d by troubleman; date O. K.'d by troubleman.

The daily trouble report form reproduced herein can be used also as a weekly or monthly report. Its good points are that it embodies troubles of every description and at the same time subdivides each class of trouble, such as line and instrument, switchboard, cable, private branch exchange or extraordinary trouble. It also provides for a summary of trouble, shows the average duration of trouble, average time clearing trouble, and number of inspectors, borrowed men, etc. It is well occasionally to maintain such a report for each district, and summarize all daily district reports in one monthly report. It is also a good plan to summarize all the daily reports for each district and to show a monthly report of every district, so her residence telephone, and while she is out shopping the troublemen will arrive and be unable to gain entrance. The lady returning and not finding the telephone repaired will criticize the delay occasioned. To obviate this, a small printed slip, which is reproduced on a previous page, is left by the troubleman in all such instances.

This is only one of the little things which go to make up a well managed maintenance department, for anything, however small, which is done to keep the subscriber in a contented frame of mind contributes more than one would realize to the ultimate success of a company.

Bell Company Cuts Long-Distance Rates in Ohio.

The Bell interests in central Ohio, represented by the Central Union Telephone Company, announced still another cut in long-distance rates to competitive points last week.

Form HT 76

DAILY TROUBLE REPORT

The Home Telephone Company of Detroit

DEPARTMENT OF SERVICE

Exchange ..... District ..... Date .....

Weather A. M. ..... P. M. .....

Subscribers Line Trouble	Central Office Line: So'bd cable	So'bd coun.	Inter. frame	Main frame	Con. Office Protector: Heat coil	Carbons	Cable: Underground	Aerial	Pot. head	Cable Terminal: Terminal strip	Fuses	Running wire	Aerial Line: Main line	Drop wire	Sub-Station Protector: Fuses	Heat coil	Carbons	Sub-Station Line: Line wire	Ground wire	SUB-STATION INSTRUMENT: Inst. pedestal	Transmitter	Trans. cord	Mouthpiece	Rec. coil	Receiver	Rec. cord	Diaphragm	Hook switch	Ringers	Condenser	Pedestal cord	Ext. Drops	MISCELLANEOUS: Mag. ext. bell	Vib. ext. bell	Battery	Meter	Money device	Buzzers			
Short circuit																																								
Ground																																								
Cross																																								
Open																																								
Cut out																																								
Scrape																																								
Swing																																								
Low insulation																																								
Face transmission																																								
Connections																																								
Changed																																								
Adjusted																																								
Line gang																																								
P. B. X. Sub-station																																								
TOTALS																																								

Switchboard Trouble	Line lamp	Supv'y lamp	Pilot lamp	Ans'g jack	Mult. jack	Lamp jack	Line relay	Cut-off relay	Supv'y relay	Protection rels	Pilot relay	Ringing key	Listening key	Order cir. key	New cord	Switch cords	Plugs	Op'rs ind. coil	Op'rs set	Repeating coil	Ret. coils	Condenser	Position wiring	Common wire	Connections	Fuses	Generator	Battery	Order circuits	Inc. trunk	Busy back	Drop	Buzzer	Opals	Plug fiber	Tips in jacks	Plug seats	Desk	TOTAL	Found O. K.	Found outside
Central office																																								
P. B. X.																																								

SUMMARY	Actual Trouble	O. K. On Test	TOTAL
Brought forward			
Reported today			
Total to clear			
Carried over			
Total acted on			
Total subscribers' line trouble			
Tested O. K.			
Found O. K.			
Receivers down; tested O. K.			
Receivers down; troubleman sent			
Total Cen. Office switchboard trouble			
Found O. K.			
Found outside			
Total P. B. X. switchboard trouble			
Found Ok. K.			
Total reports			
Employees			
Employee hours			
Hours on trouble			
Average duration of trouble			
Average time clearing trouble			
MISCELLANEOUS			
General inspection			
Number of men borrowed			
Hours borrowed			

EXTRAORDINARY TROUBLE

Underground / Aerial — Cable Break. Cable No. ..... Lines out of Service. Location of Trouble .....

Cause of Trouble .....

Signed ..... Wire Chief

The Daily Trouble Report Form Which is Used to Summarize the Various Cases of Trouble.

that a special study can be made to determine in what location a certain kind of trouble is abnormal.

Many so-called bad spots on the outside are due to wires in trees. At one time covered wire was used to clear lines of tree grounds, but experience has proven that the insulation will in a short time wear off, leaving an intermittent case of trouble and a more difficult one for the troubleman to locate. The only safe method to follow in this regard is to use bare wire wherever possible, and then to see to it that it is kept clear of all obstructions. When permission can be obtained, the tree should be trimmed, but being unable to do this, the next course to pursue is to extend the cross arms far enough to get the necessary clearance. In some cases the trees spread on either side of a pole so far that it is necessary to run lock aerial wires from a point on cross arms where wires would best clear the trees.

Very often the lady of the house will report trouble on

The cut is the third since the inauguration of what is supposed to be a fierce rate cutting war on the part of the Bell interests, to stimulate business and cripple the Independents whenever possible. The cut in rates is only between competitive points and the rate now is in many cases about half or one-third of what it was the first of the year.

The Independents report they will not meet the cut, as it would simply mean doing business at a loss. They are of the belief that the cut will affect the Bell interests much more than their own, and are not making any concessions at the present time.

New York State Forests May Install Telephones.

The State of New York, through its forest, fish and game commission, is considering the advisability of establishing a telephone system in the Adirondacks, to be used in fighting forest fires which are frequent during the summer and fall in that region.

Practical Letters from the Readers

A Talking Protector—Will Wonders Never Cease?

In our common battery exchange a certain line showed a permanent signal. The line was placed on test, and was found to be "looped." The measurement was the same as that shown with a receiver down. When listening on the line conversation and other noises at the subscriber's station could be heard, and different sounds in the same room with the instrument were picked up quite plainly. A man sent to the station found the receiver on the hook, and the line still in trouble. Examining the protector he found the line carbons fallen from their places, and resting against the metal cover. The pressure of the carbons was enough to form a microphone sufficiently delicate to pick up ordinary sounds in the same room.

Tacoma, Wash. J. M. S.

Crackling of Steam Pipes Charged Up to Telephone Man.

Back in the days of local wet batteries a woman in an Eastern city called up the manager of the telephone company, and, with considerable excitement betrayed in her voice, told him that a man came yesterday and recharged the batteries, and that soon afterward they started their new steam heater and the pipes made a terrible crackling. She said she wished that he would send a man right away to see about it.

Manchester, N. H. A. A. Jenkins.

Possible Cause for False Rings.

In an issue of TELEPHONY, published last spring, I noticed an inquiry regarding false rings on a ground return system, the reply being that there was probably leakage in the weatherproof wires used between the pole and the distributing rack.

While this might easily be the case, I have found that as a rule false rings on grounded systems are caused by a high resistance ground at the office, thus causing the ringing current to divide, so that part returns over the lines which are giving trouble, when any other line is rung. The current is not strong enough to ring the bells loudly, or even to throw the drop, but the tinkling will sometimes be mistaken for an intended ring.

Referring to the diagram, when line No. 1 is rung, line No. 2 will take part of the return current if the ground at the office is poor or contains any noticeable resistance *R*, thus causing bells on line No. 2 to tinkle.

If an iron wire is used at the office to connect with the

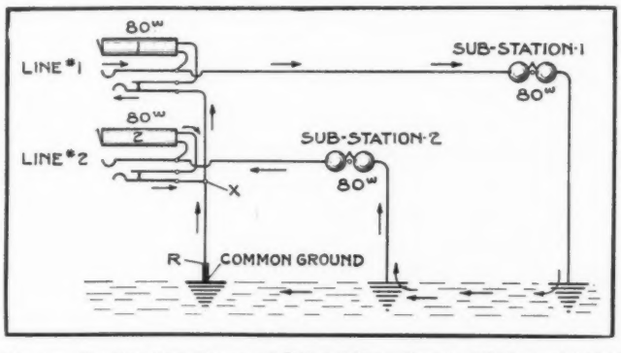


Diagram Illustrating Cause of False Rings Due to High Resistance Ground.

ground, it will often contain enough resistance to cause this trouble. An unsoldered connection at *X* or *R* will be found to be the fault.

Almost all companies using a ground return have trouble from false ringing unless a heavy copper ground wire, soldered to a large plate, is used for a common ground for all lines at the exchange end.

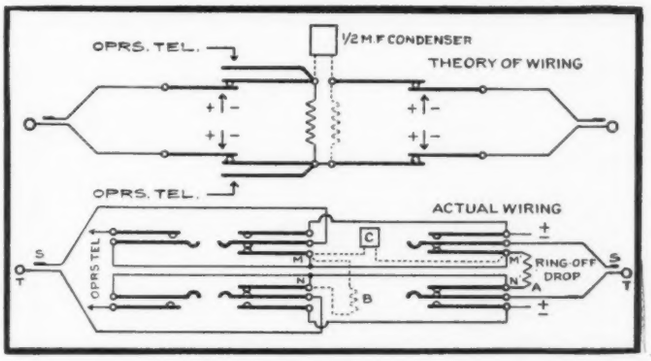
The lines of lowest resistance will bother most. In the winter a partly frozen ground is liable to be found, and will have the same bad effect. Proper attention to securing a good ground will also reduce the cross talk.

Burlington, Ia. E. L. Gaines.

Condenser to Prevent Ringing Through Cord Circuit.

I have just read Mr. M. C. Wilson's method of eliminating his "Poor Ring Off" troubles published July 10.

The method he uses is far ahead of what they did have



Switchboard Wiring to Prevent Ringing Through the Cord Circuit.

to contend with, and will probably prove very satisfactory, but I don't like the idea of cutting out the shunt on series telephones where the trouble can be eliminated once for all by cutting in one ½ m. f. condenser in the cord circuit.

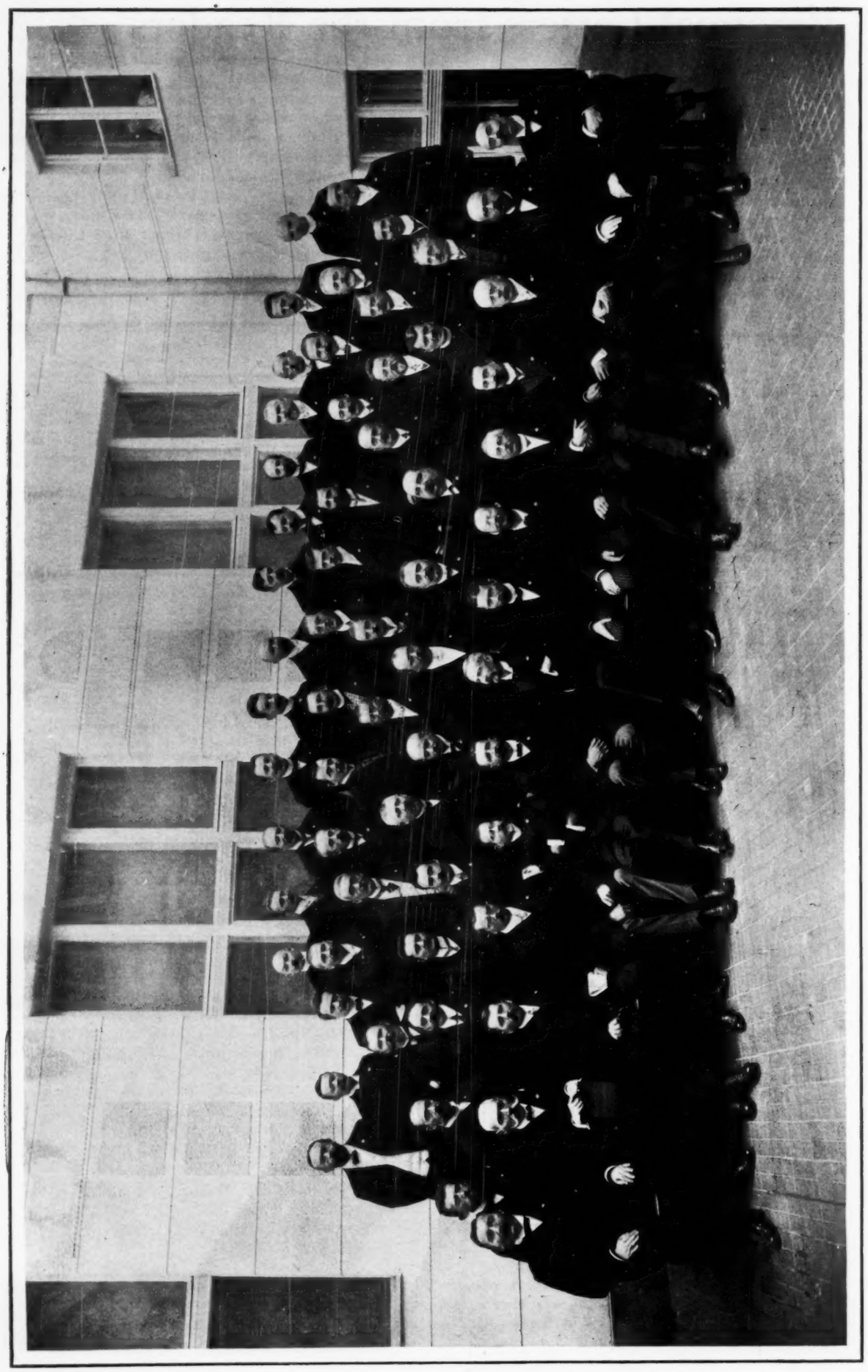
This makes it necessary to install another ring-off drop for each cord circuit, or have each drop wound with two coils.

One great advantage derived from this arrangement is that a subscriber can't ring through the board, thus eliminating the anoyance of answering a call when another party is ringing central while a connection is up. I realized long ago that telephone men have too many troubles to contend with to permit any to remain that can be eliminated. In my case I removed the bottom row of drops and jacks, and placed them at the top to make room for an extra row of ring-off drops. This done, the drops were bridged across the cord circuit with a ½ m. f. condenser cut in between them in the sleeve side (line side) of the cord circuit. It only took a few days to make the change, and never interfered with the service while the work was being done. The diagram of my board showing the circuit is to be read as follows: The dotted line shows the circuit after the change was made; *A* is the original ring-off drop; *B* is the ring-off drop which was added; contact springs *M* and *M'* were disconnected from the strap and wired to the condenser; the second drop *B* was connected to *M N*, as shown. The sleeve side of the cord circuits connect with the line, the tip with ground.

Mr. Wilson's plan is a step in the right direction, but I would not recommend that plan when the switchboard key is so constructed as to make the change possible as shown in my diagram,

Besides, the good results obtained will more than repay for the time and expense of installing condensers and extra ring-off drops.

Tolar, Tex. Price Kiker,
Proprietor, Tolar Telephone Company.



Cimponeriu, Berdenich, Lázár, Haltenberger, Rédl, Hollós, Fritz, Gati, Paskay, Hansel, Barthel, Holzmann, Mirabelli.
Dietl, Patlevicz, Steidle, Schaden, Ratkovsky, Müller, Julcher, Purves, Komarnicki, Tanasescu, Pirro, Herz, Fodor, Ivcevic.
Gadomski, Sándor, Gutzmann, Wittichen, Vater, Hultmann, Günther, Major.
Stecher, Balla, Hili, Vidic, Marini, Havelik, Kraatz, Knabe, Stegu, Proper, Filepek, Gebhard.
Ferid, Montinari, Rousseff, Stegmann, Radacovish, Barth, O'Meara, Kolossváry, Strecker, Collette, Evangoulow, Rydin, Krarup Emin.

Telephone Engineers of Europe

"Comptes Rendues de la Premiere Conference Internationale des Techniciens des Télégraphes et Téléphones" is the imposing title of a magnificently printed book setting forth much information of value about telephone and telegraph development in Europe. Further, it commemorates the first gathering of the technical leaders in operating the government telephone and telegraph system of Europe, a movement which, if followed by similar conventions from year to year, cannot fail to have a beneficial influence on the art of communication by electrical agencies.

The attendance at this convention included many of the most distinguished engineers and electricians of Europe.

The holding of this conference was the result of suggestions made by the Hungarian and French representatives at the General International Telegraph Conference at London in 1904, revived and developed by the Hungarian administration. Accordingly, the meeting was most appropriately held at Budapest, and owes much of its success to the earnest exertions of the Hungarian officials.

The transactions of the conference are printed partly in German, and partly in French. The names of delegates, with their titles, are as follows:

Austria.—M. Karl von Wehrenalp, Conseiller aulique, Chef de la Section technique; M. H. G. Dietl, Conseiller supérieur technique; M. Franz Patlewicz, Conseiller supérieur technique; M. M. O. Filepek, Conseiller technique; M. Wladislaw Gadomski, Conseiller technique; M. Karl Hansel, Conseiller technique; M. A. Sandor, Conseiller technique; M. Anton Stegu, Conseiller technique; M. Karl Havelik, Commissaire supérieur technique; M. Rudolf Knabe, Commissaire technique; M. Franz Stecher von Sebenitz, Commissaire supérieur technique; M. Mate Ivcevic, Ingénieur, Elève de construction.

Bulgaria.—M. M. Rousseff, Chef de la Section technique.

Denmark.—M. C. E. Krarup, Chef du Département des Télégraphes.

France.—M. Estaunié, Director du Matériel et de la Construction; M. A. Dennery, Ingénieur-en-chef des Postes et Télégraphes, Director du Cabinet du Sous-Secrétaire d'Etat; M. Bazille, Ingénieur-en-chef, chef de Bureau.

Germany.—M. le Professeur Dr. Strecker, Conseiller intime supérieur des Postes; M. A. Kraatz, Ingénieur des Télégraphes; M. F. Gutzmann, Ingénieur des Télégraphes; M. Th. M. Barthel, Secrétaire des Télégraphes; M. Gebhard, Conseiller impérial, Directeur des Télégraphes; M. E. Günther, Elève de Construction supérieur; M. W. Herz, Inspecteur des Télégraphes; M. Müller, Inspecteur supérieur des Postes; M. Ritter (Württemberg), Conseiller technique; M. F. Stegmann (Bavière), Conseiller des Postes; M. H. K. Steidle (Bavière), Adjoint supérieur des Postes; M. E. Wittichen, Ingénieur des Télégraphes.

Great Britain.—Major W. A. J. O'Meara, C.M.G., R.E., Engineer-in-Chief; Mr. T. F. Purves, Staff Engineer; Mr. J. G. Hill, Engineer.

Holland.—M. A. E. R. Collette, Ingénieur-en-chef des Télégraphes et Téléphones d'Etat, Directeur du service technique; M. F. C. Proper, Chef des Matériaux des Télégraphes et Téléphones d'Etat.

Hungary.—M. André Kolossváry, Premier Directeur technique, Chef du service technique; M. Joseph Váter, Directeur technique; M. Paul Balla, Conseiller technique; M. Frédéric Schaden, Conseiller technique; M. Joseph Hollós, Conseiller technique; M. Etienne Bayler, Conseiller technique; M. Edmond Ratovszky, Conseiller technique; M. Charles Holzmann, Conseiller technique; M. Jules Burzogany, Ingénieur supérieur; M. Leopol Lazar, Ingénieur supérieur; M. Julien Fodor, Ingénieur supérieur; M. Bernard Paskay, Ingénieur supérieur; M. Béla Gati, Ingénieur supérieur; M. Samuel Haltenberger, Ingénieur supérieur; M. Eugéne Rédl, Ingénieur; M. Béla Julcher, Ingénieur; M. Ernest Berdenich, Ingénieur; M. Charles Kisfalndy, Ingénieur; M. Denis Cimponeriu, Second Ingénieur; M. Dezsö Véghely, Second Ingénieur; M. Ernest Zerneck, Second Ingénieur; M. Josef Kuchejda, Second Ingénieur; M. Ladislas de Komarnicki, Second Ingénieur; M. Augustin Maior, Second Ingénieur; M. Eugéne Fritz, Second Ingénieur.

Italy.—M. le Professeur Giovanni di Pirro, Chef de Section dans l'Institut supérieur postal-télégraphique; M. Salvatore Montinari, Secrétaire chez la Direction Générale des Télégraphes; M. le Docteur Enrico Mirabelli, Inspecteur central technique.

Roumania.—M. Georges M. Radacovitch, Ingénieur, Chef de la Division technique; M. Carol J. Vidic, Ingénieur des Télégraphes; M. A. Marini, Ingénieur des Télégraphes.

Russia.—M. Balthazar Evangoulow, Ingénieur Electricien, Chef de la Division technique.

Servia.—M. Jacques Petrovitch, Chef de Section; M. Milan Georgevitch, Chef de Section; M. Kosta Dantchevitch, Chef de Section.

Sweden.—M. Axel Rydin, Chef de la Division technique à la Direction des Télégraphes; M. Axel Hultman, Directeur des Téléphones d'Ètat.

Turkey.—M. Hassan Férid, Directeur de la Fabrique; M. Mehmed Emin, Sous-Chef du Bureau des Ingénieurs.

The conference was organized by the election of M. Kolossváry, president; Major O'Meara, vice-president, and a bureau of administration including M. Hollós, chief, and editors as follows: M. Gutzmann, M. Sandor, M. Hill, M. Mirabelli, M. Vidic, M. Fodor, M. de Komarricki.

Among the papers bearing upon telephone practice were: "The Use of Underground Cable for Telephone Purposes," by M. Krarup; "The Furnishing of Current for Telegraph and Telephone Service by Means of Secondary Batteries," by Dr. Strecher; "Discussion of the Relative Merits of Automatic and Manual Systems," by M. de Barth; "Fundamental Technical Data and Economic Results of Semi-Automatic Working in Town and Country Telephone Exchanges," by M. Steidle; "The Impedance of Non-Uniform Telephone Circuits," by Prof. di Pirro; "Systems of Party Lines Serving Several Telephone Stations," by H. Gutzmann; "Cutting Out of Circuit Intermediate Stations on Long Lines," by M. Hollós; "Description of the Stockholm Telephone Exchange System," by M. Hultman.

Abstracts of discussions on other telephonic subjects will be reproduced, by courteous permission of officers of the conference in subsequent pages of TELEPHONY.

Unfortunately France was not represented at the conference, on account of a recent destruction of the principal exchange at Paris. Its restoration demanded the constant presence of the principal officers of the administration.

New Columbus Independent Directory Carries Large Amount of Advertising.

The Columbus Citizens Telephone Company, of Columbus, O., has issued a new directory which contains a full list of telephones used in Columbus. There are more than 10,000 names in the book. The company has a large amount of advertising in the book, indicating a disposition on the part of local advertisers to go into that sort of display business.

The Legal Side

By A. H. McMillan

Collecting Assessments Against Stockholders.

Please answer through the columns of TELEPHONY the following queries:

We have a farmers' Mutual company incorporated under the State laws.

Stock is paid for in telephone lines. The members form companies of five or more and come into the general company by turning in the line they build and paying $1.00 charter fee for each member.

On April 2nd the stockholders, 543 in all, at that time met and levied an assessment of 75 cents on each stockholder for the purpose of doubling lines and erecting trunk lines

About 75 per cent of the stockholders own and have installed their own telephones and the remaining 25 per cent do not have telephones as yet, but get free use of the lines by means of their neighbors and the other telephones of the system.

The nature of the organization is such that there is no income other than the one dollar charter fee above named, which will soon run out and a very light toll receipt from non-members amounting to only about $30 for the last year. The expenses of all kinds must be met by assessment.

Stock certificates do not contain the "fully paid and non-assessable" clause.

Some of the members say they will not pay this assessment. Kindly advise us just how we can collect from parties who refuse to pay. Some of them do not have the exemptions. Can we sell their stock? Any suggestions or information will be appreciated.

Assessments of stockholders may be collected in two ways. These are, by enforcing a lien upon the stock and selling it to pay the assessment, and by suing the stockholder and collecting in the same way as any other judgment may be collected. A lien upon stock for failure to pay assessments exists only when given by statute or the charter of the company. We, therefore, assume that one does not exist in your case as you do not state that such a lien is provided for by the laws of your incorporation or by the charter of your company. The process of collection that would remain for you is therefore that of ordinary suit. Where your stockholder has no tangible property upon which to levy, you may proceed by levying upon his stock in your company as this procedure is undoubtedly provided for in the statutes of your state.

If your statute gives the right to sell the shares of a delinquent stockholder for unpaid assessments, you may use either method or, in case the attempt to foreclose your lien upon his shares is unsuccessful, you may then proceed by action, an unsuccessful attempt to sell the shares not depriving the company of its remedy by action. Stone vs. Frankfort Bridge Co., 2 Bibb. 576 (Ky.), 5 Am. Dec. 638.

Damages for Breaking Manhole Covers.

Will you kindly advise me whether or not you have any record of any court decisions bearing on the question of the damaging or the breaking of manhole covers located in the streets of cities or villages, due to the hauling along said streets of extra heavy loads, such as structural iron, etc.?

We have no record of any court decisions upon the subject you inquire about. It seems as though there should be no liability, on principle, for damaging or breaking manhole covers by hauling extra heavy loads over them, located in the streets of a city. The streets are intended primarily for public travel. Any persons or corporations placing manholes in the streets must be held to have notice of the purpose of the street. There has never been any limit to the size or kind of loads that may be lawfully carried in a city street and any ruling that would render a person liable for hauling an extra heavy load, would be a serious interference with the public use. The persons constructing the manholes should be required to construct them of such heavy material as to stand any load that might possibly be hauled through the street. If there were any liability imposed upon the teamster or his employer for hauling a heavy load, the city ought to be in as good position to recover damages for injury to the pavement as an owner of a manhole would be. No such liability in favor of the city has ever been imposed and its imposition would seem unreasonable.

City May Prescribe Manner of Construction.

The Oklahoma State Supreme Court in affirming the injunction granted by the district court of Pittsburg County in the case of South McAlester and Buffalo Telephone Company vs. State of Oklahoma ex rel Baker-Reidt Mercantile Co. et al, of Hartshorn, holds that "a franchise granted by a municipality to a telephone company is a contract and after the telephone company has accepted the franchise by erecting its poles upon the streets, alleys and public thoroughfares of said town and stringing its wires thereon, the manner of construction being therein prescribed, for which privilege it undertook to furnish telephones and tolls at a certain stipulated price; it will not be permitted thereafter to repudiate its part of the undertaking, the town having at least the corporate powers to regulate the manner of construction, as long as it uses the privileges under said franchise."

The defendants in error on May 11, 1908, asked for an injunction against the McAlester Eufala Telephone Company, which, on June 29, 1904, was granted a franchise by the city of Hartshorn under the Act of Congress approved March 3, 1901. The complainants in the lower court set up the fact that the telephone company had served notice of a raise in its rates over the maximum amounts designated in the franchise, namely, $2.50 for business telephones, $2.00 for professional and $1.50 for residence telephones. They also set up the fact that the company was laying its poles in and through the streets of Hartshorn in violation of its contract and asked for an injunction against the telephone company from raising the rates and that it be enjoined from laying its wires in the streets and alleys of Hartshorn in violation of the contract. The injunction prayed for was granted.

The action of the lower court is fully sustained by the appellate tribunal. As to the city's authority over poles and lines in the public thoroughfares, the decision says: "The city or town has undoubted authority to provide the manner of construction." The court cites the following cases that are directly in point: City of St. Louis vs. T. Davidson, 102 Mo. 153.14 S. W. 325, and Town of Montecello vs. Cohen et al, 48 Ark. 254 S. W. 30. See Southwestern Reporter.

Prevention of Contact.

A telephone company running its wires across a lot without permission of the owner owes to one rightfully on the lot engaged under employment in erecting a building thereon, the duty to use ordinary care to prevent injury by the transmission to its wires, of electricity escaping from other wires. This rule was laid down in an action brought against the Southwestern Telegraph & Telephone Company at Fort Smith, Arkansas. The company's wires were stretched across vacant lots where they sagged down to a distance of nine or ten feet from the ground. In crossing a street nearby they extended above the heavily charged electric wires of a street car company and were wholly unprotected from coming in contact with the trolley wires should they fall. Upon the vacant lots a barn was being erected where the man, injured, was employed. The wires ran through the barn, and while the

plaintiff was absent one broke and one end thereof lay hanging down on the foundation of the house. The plaintiff returned; he picked up the wire to throw it aside and was burned. In breaking, the telephone wire had fallen across the trolley wire and thus became heavily charged with electricity. The telephone company contended that the wire was in good condition the day of the accident. The breaking of the wire seemed to have been caused by its being hit with a ladder when in the barn, but the evidence was not definite on this point.

From a judgment for the plaintiff the telephone company appealed to the Supreme Court of Arkansas, which reversed the case and ordered a new trial. Southwestern Tel. and Tel. Co. vs. Bruce, 107 S. W., 564.

Queries From the Field

Uneven Load on Storage Cells in a Battery.

Is the use of one or more cells of storage battery more than others, for some special purpose, injurious to the cell or objectionable in practice? It would seem to me that such a cell would have to be charged separately.

The practice of using part of a storage battery more than the rest is not to be commended. In the hands of a careful man who may be depended on to keep close watch of these special cells, very good results may be had. In itself, there is nothing in the practice to injure the cells. You will have to provide separate charging leads and resistance for these cells, since they will not be fully charged by the time the rest are. After the main battery is full, these special cells will have to continue until their voltage and gravity show the proper figures. But the using of these cells more than the rest will wear them out sooner and make the replacing uneven. As a result, we should call it objectionable in practice.

Inductance and the Loading of Cables.

Will you please advise why a high inductance is desirable in a telephone circuit? Does separating the two wires increase the inductance, and why? Do loading coils increase the inductance and if so, how do they? Why cannot large gage wires be successfully loaded? Can you briefly say just what is meant by inductance? Does the "KR" law still apply to cable circuits? Will you give the formula?

In a telephone transmission line, unloaded, capacity and resistance are the most prominent properties. In cables the inductance, L, is so small as to be neglected without error, though overhead wires strung on insulators have some inductance. The first point to learn is that telephone transmission consists in the sending of a series of electrical waves over a metallic circuit, and that the current is not of the same strength at the same instant at all points in the circuit. If we let $U =$ amplitude of the wave at the sending station, and $Us =$ amplitude of the wave at a distance of s miles, then the ratio of the latter to the former will show how much the current is being weakened, or the wave attenuated, by the line. That is, if the amplitude corresponds to one milliampere (.001 ampere) at the sending end and only 50 microamperes (.000050 ampere) at the receiving end, then the ratio is

$$\frac{Us}{U} = \frac{.000050}{.001} = \frac{1}{20} = .05 = 5\%$$

That is, only five per cent of the current which starts out gets to the receiving end. It has been shown by undisputed authorities that the ratio has the following value:

$$\frac{U_s}{U} = \frac{1}{\epsilon^{\beta S}}$$

where ϵ is the base of the Naperian logarithms (2.718), s is the distance in miles, and β is the attenuation constant. For lines possessing resistance, inductance, and capacity, the value of the last is

$$\beta = \frac{R}{\sqrt{2}} \sqrt{\frac{C}{L}}$$

where R is the loop resistance in ohms, L the inductance in henrys, and C the capacity in farads, all per mile of line. If the capacity is large and the inductance small it will be seen that the attenuation constant, β, will be large. This is the condition in most telephone lines. Since we can not make the capacity any smaller, we can help matters by increasing the inductance, provided we insert it in such a manner as not to cause the reflection of the wave. This is done by putting in many small coils instead of one large one, as the latter would do more harm than good.

It is the resistance of the wire that causes the weakening or attenuation of the current, but the relation between inductance and capacity regulate the loss.

Separating the wires increases the inductance by affording greater area between the wires for lines of magnetic force. The more lines of force set up by a given current the larger is the inductance. Loading coils increase the inductance because they are wound inductively, that is, the same way you would wind a coil for a relay or magnet.

Large gage wires have low resistance, so that for moderate distances the attenuation is not great. The low resistance keeps the value of β down. Experiments have shown that on open wire circuits of No. 8 B. W. G. copper, the unloaded line gave more current at the receiving end than the simple loaded line up to about 500 miles. Beyond this the loaded line was better.

By inductance is meant the storing up of energy in the space around a current-carrying wire, the energy being in the form of a magetic field. The energy is all returned to the circuit.

The K R law does not apply to cable circuits. The attenuation factor, $\frac{U_s}{U}$, given above takes its place. We may say safely that if 2.5% of the current at the sending end gets to the receiving end and is in undistorted form, the line will be satisfactory for telephone purposes. This is equivalent to having the attenuation constant, β, equal to .015. It should not be greater than this value. The full formula for β is

$$\beta = \sqrt{\tfrac{1}{2}} p C \left(\sqrt{p^2 L^2 + R^2} - pL \right)$$

in which $p = 6.2832$ times frequency.

Charging Portable Storage Battery.

I would like to know if you could give me some information on charging a portable storage battery. It is a Witherbee three cell six volt, 40 ampere battery and I have a 24 volt charging apparatus. I charge my storage batteries for the exchange at 7½ amperes. I have a Kellogg power board and a direct connected motor and generator. My voltmeter reads as high as fifty volts and my ammeter is the same. If you could give me a diagram or some information you would be conferring a great favor on me.

I would want to charge this battery while I am charging my main batteries.

The charging rate of the portable battery should be given on the battery case. It probably is a 40 ampere-hour battery, in which case the charging rate would not be far from 5 amperes. If so, connect the Witherbee battery in series with the exchange storage battery and charge at about 5 amperes.

Among the Companies

Convention of Canadian Independent Telephone Association at Toronto, September 8.

The following circular has been sent to members of the Canadian Independent Telephone Association:

Arrangements are now being made for the 1909 annual convention of the Canadian Independent Telephone Association, which will be held in Toronto on Wednesday, September 8th, during the second week of the exhibition.

Among the subjects to be discussed will probably be the following:

"Is the Telephone a Natural Monopoly?" By F. Dagger.
"Good Construction."
"Proper Rates for Rural Service."
"Collections."
"Independent Telephones in Railway Stations." By C. Skinner and others.
"Exchange Directories." By Dr. W. Doan.
"Reasonable Toll Connection Relations."
"Good Operating."
"Independent Telephone Situation in Canada." By Dr. Demers, Dr. Doan, F. Dagger and others.
"Forced Physical Connection."

Members are invited to send to the secretary, F. Page Wilson, 226-227 Confederation Life Building, Toronto, any suggestions for other topics to be discussed. Also any questions on practical telephone subjects, so that they can be dealt with in good time before the convention.

Keystone Telephone Company's Good Year.

The annual report of the Keystone Telephone Company of Philadelphia, Pa., which has recently been issued, shows that the gross earnings of the company in the twelve months ended June 30 last were $1,073,462, an increase of $22,390 over the preceding year. The surplus for the year was $130,147, a gain of $31,309 over the previous twelve months.

The report, which was presented by President Nathan T. Folwell, is as follows:

To the Stockholders and Bondholders of the Keystone Telephone Company of Philadelphia:

In presenting this, the fourth annual report of the company under the present management, the policy heretofore established of treating the Keystone Telephone Company of Philadelphia and the companies owned by it as one property has been followed.

The property consists of the Keystone Telephone Company of Philadelphia, which holds a perpetual charter from the state of Pennsylvania and a perpetual franchise from the city of Philadelphia; also perpetual franchises in thirty-eight boroughs and townships in Delaware, Montgomery and Bucks counties in the state of Pennsylvania; and the Eastern Telephone & Telegraph Company, which holds unrestricted franchises in the cities of Camden, Gloucester, Woodbury, Cape May, Merchantville, and all other towns in the counties of Camden, Gloucester and Cape May in the state of New Jersey, and also controls the Camden & Atlantic Telephone Company through ownership of a majority of its capital stock.

Improvements: During the past year the company has added to its Philadelphia real estate holdings by purchasing three lots on Summer Street, adjacent to the Race Exchange, and constructing a substantial factory building and shop. This building is so situated that power, light and heat can be taken from the power plant of the Race Exchange. The capacity of our toll lines has been very materially increased and extended. Additional conduits have been constructed in Philadelphia and Camden, and the capacity of the cable system has been increased in both cities.

An additional submarine cable has been laid in the Delaware River, increasing our facilities between Philadelphia and Camden and other South Jersey points.

It has not been found necessary to materially increase the switchboard capacity during the past year.

The conduit system has been extended and now consists of over 12,500,000 feet of vitrified tile ducts located in 335 miles of street and containing over 2,500,000 feet of lead covered cable.

In addition to the home plant, the company operates in twenty-one suburban towns and a large number of villages.

At the present time 30,000 Keystone telephones are installed in Philadelphia and its suburbs, as against 17,000 in 1905, 21,000 in 1906 and 27,000 in 1907.

Funded Debt: The amount of first mortgage five per cent bonds outstanding was increased during the year by $131,000, making a total on June 30 of $5,443,000, of which $720,000 is pledged as collateral security for $600,000 three-year six per cent collateral trust gold notes, due March 1, 1910. Since the close of the fiscal year the company has exercised its option and called for the above notes for redemption on September 1, 1909.

The amount of Eastern Telephone & Telegraph Company first mortgage five per cent bonds of 1922 remains unchanged at $250,000.

During the year the total of six per cent collateral trust bonds was reduced to $210,000 through the retirement of $41,000 bonds.

Maintenance: The usual liberal policy has been pursued in regard to maintenance. No reasonable expense has been spared to keep the property in the highest state of efficiency. Operating cost has been still further reduced, as will be noted by reference to the statement of comparative earnings and expense.

Reserve Fund: The accumulated reserve on June 30th aggregated $467,212.49.

Earnings: For your convenience there is given below a comparative statement of earnings of the combined companies for the two fiscal years 1908 and 1909:

	1909	1908	Increase	Increase, Per Cent.
Gross earnings	$1,073,462.15	$1,051,071.56	$22,390.59	2.13
Operating and Maintenance Charges, including Taxes and Provisions for Doubtful Accounts	531,008.75	539,122.88	*8,114.13	*1.54
Balance Available for Interest and Reserve, Etc.	542,453.40	511,948.68	30,504.72	5.96
Reserve for Renewals	100,000.00	100,000.00	.....	....
Interest Charges	312,307.78	313,112.48	*804.70	*.03
Net Profit for Year	$130,145.62	$98,836.20	$31,309.42	31.68

* Decrease.

Ratio of operating and maintenance charges, including taxes, to gross earnings 49.5 per cent in 1899 and 51.3 per cent in 1908.

In Conclusion: It is gratifying to note that business is again nearing a normal level and that we are able to report a substantial increase in earnings over the previous year. With the property being maintained in the highest efficiency and serving a desirable and substantial class of subscribers, it seems reasonable to expect that the company will make an even better showing this year than was made during the past fiscal year.

The combined balance sheet of the Keystone Telephone

Company of Philadelphia, the Keystone Telephone Company (of New Jersey) and the Eastern Telephone & Telegraph Company as of June 30, 1909, is as follows:

ASSETS.

Cost of Property, including stocks	$13,620,570.69
Keystone Telephone Co. of Philadelphia, First Mortgage 5% Bonds Pledged as Collateral	862,000.00
Materials and Supplies on hand	97,228.39
Cash at Banks and on hand	180,904.42
Accounts and Notes Receivable	168,418.35
Renewal Reserve Fund	66,441.09
Accrued Assets	24,275.02
	$15,019,837.96

LIABILITIES.

First Mortgage 5% Bonds issued by the Keystone Telephone Co. of Philadelphia	$ 5,443,000.00
First Mortgage 6% Collateral Trust Bonds issued by the Keystone Telephone Co. of Philadelphia	210,000.00
Three Year 6% Collateral Trust Gold Notes issued by the Keystone Telephone Co. of Philadelphia	600,000.00
First Mortgage 5% Bonds issued by the Eastern Telephone & Telegraph Co.	250,000.00
Notes, Accounts Payable, Resources and other Current Liabilities	384,974.48
Total Liabilities	$ 6,887,974.48
Renewal Reserve	467,212.49
Capital Stock Issued:	
6% Preferred by the Keystone Telephone Co. of New Jersey	1,936,850.00
Common by the Keystone Telephone Co. of New Jersey	5,000,000.00
Surplus	727,800.99
	$15,019,837.96

The combined profit and loss account of the Keystone Telephone Company of Philadelphia, the Keystone Telephone Company (of New Jersey) and the Eastern Telephone & Telegraph Company for year ended June 30, 1909, shows the following:

Gross Earnings		$1,073,462.15
Operating and Maintenance Charges, including Taxes and Provision for Doubtful Accounts		531.008.75
Balance Available for Interest and Reserves		$ 542,453.40
Reserves for Renewals	$100,000.00	
Interest Charges	312.307.78	412,307.78
Net Profit for the Year		$ 130,145.62
Surplus Account of June 30, 1908	$602,271.80	
Less sundry adjustments made in 1909, but pertaining to 1908	4,616.43	597,655.37
Surplus July 1, 1909		$ 727,800.99

The officers and directors of the company are: President, Nathan T. Folwell, Philadelphia, Pa.; vice-president, James Collins Jones, Philadelphia, Pa.; secretary-treasurer, William W. Wharton, Philadelphia, Pa.; general manager, C. E. Wilson, Philadelphia, Pa.; F. Wayland Ayer, Philadelphia, Pa.; Marcus Beebe, Boston, Mass.; George Burnham, Jr., Philadelphia, Pa.; Percival E. Foerderer, Philadelphia, Pa.; N. T. Folwell, Philadelphia, Pa.; Clarence L. Harper, Philadelphia, Pa.; James Collins Jones, Philadelphia, Pa.; George Kessler, Philadelphia, Pa.; Huelings Lippincott, Camden, N. J.; Michael Murphy, Philadelphia, Pa.; C. E. Wilson, Philadelphia, Pa.

Telephone Pole Tax Cannot Be Enforced in Kansas City.

The Board of Public Works has been informed by Ben R. Estill, the associate city counselor, that in the light of an opinion rendered recently by Justice McKenna of the United States Supreme Court, the ordinance taxing telephone poles $1 each a year is invalid and cannot be enforced.

Justice McKenna ruled that only such tax can be levied as is necessary and reasonable for the actual expense of inspection. Mr. Estill adds that the board has no power to hold up the granting of pole permits to telephone companies under the ordinance demanding the $1 a year tax; that its authority ends at seeing that the poles do not interfere with traffic.

A Good Illuminated Sign.

The Independent Telephone Company, of York, Neb., is using an illuminated sign which is made from an especially useful and attractive design. The sign is shown in the accompanying illustration. The size of the enclosing glass plates is 36x36 inches, the Shield being 26x24 inches

An Artistic Illuminated Sign.

in maximum dimensions. The panel carrying the words "Long Distance" is 32x36 inches in size. The total weight of the sign is 30 pounds. Between the two plates are six 4-candlepower lamps, giving an illumination so that the sign can be seen for a considerable distance on either side at night. The colors are as follows: Shield, red, white and blue; panel, black ground with white lines; background, blue. Mouldings are of oxidized copper around the sign, gold around the shield and aluminum around the panel. The metal work is galvanized iron.

This is the design which was exhibited by General Manager W. E. Bell, of the Independent Telephone Company, at the last convention, and was most heartily commended as the best sign that had ever been seen by any one present at the convention. It was made by Mr. C. E. Peterson of York, and the cost was $25.

Increased Earnings of the Kinloch Long-Distance Company.

The statement of the Kinloch Long-Distance Telephone Company of Missouri for the six months ended June 30, 1909, which was recently issued, shows a net profit of $213,419.97, compared with $180,450.93 for the same months in 1908. The total revenue for the six months of this year was $650,838.96; operating expenses, $180,560.57; maintenance, $98,433.04; taxes, $32,112.88; interest on bonds, $126,412.50. The dividends amount to $70,000 and the surplus was $64,219.97.

Home Telephone Company of Elkhart, Ind., to Expend Thirty Thousand Dollars in Improvements.

The directors of the Home Telephone Company of Elkhart announce that $30,000 has been appropriated to improve the service and to construct two copper circuits between Elkhart and Goshen. When these are completed they will be used exclusively for business purposes and a nominal toll will be charged. At the same time improvements will be made in the local exchange plant. W. H. Shoots, the company's efficient general manager, will have

charge of the proposed work. The company now has eight lines between Elkhart and Goshen and they are overloaded with business. Under the present arrangements the free lines are burdened with "visiting" conversation, and the plan is to eliminate the "visiting" business and put on a nominal toll business which will, the directors believe, prove more satisfactory. The company is controlled by Elkhart and Goshen capitalists.

Citizens Company of Columbus, Ohio, Negotiating for Lancaster Exchange.

The Executive Committee of the Columbus Citizens Telephone Company of Columbus, Ohio, is looking over the property of the Lancaster Telephone Company, at Lancaster, with a view to acquiring the plant. Gansey R. Johnston, general manager, and E. R. Sharp, secretary of the Columbus Citizens Company, and a number of others, have made an examination of the property, and experts will now make a thorough examination.

The system, which includes the exchange in Lancaster, as well as a large number of rural exchanges, is one of the properties of the United States Telephone Company.

There is an unusually large amount of long-distance business between Columbus and Lancaster, including Bremen and Junction City, owing to the large number of oil wells being drilled at the latter points, and the capital in most cases is furnished by Columbus parties. In order to keep themselves in touch with conditions in the oil fields, the telephone is called into use. If the proposed consolidation is completed, the connection between Columbus and the oil fields will be made complete.

The Lancaster company is one of the best of the smaller Independent systems of the state. In the last financial statement which it issued, the following facts were shown: The number of subscribers in Lancaster, Baltimore, Millersport, New Salem and the toll stations at Carrol, Sugar Grove, Rockbridge, Lockville, Hooker, Pleasantville and Thornville, was 1,600; for the year ending December 31, 1908, the total receipts were $35,996, which is only a slight decrease over the previous year; the balance of cash on hand was $2,092. The company had $100,000 in common and $47,000 in preferred stock and bonds to the face value of $75,000. The plant is carried on the balance sheet of the United States Telephone Company as costing $214,441.

Pioneer Company Must Connect With Other Companies in Oklahoma.

The Oklahoma Corporation Commission on August 14 rendered a decision requiring the Pioneer Telephone & Telegraph Company to give physical connection to the Grant County Rural Telephone Company, which has over 1,500 subscribers. The order requires that this connection be made at the expense of the Pioneer company and that complete long-distance service be given to the patrons of the Grant County company, to any and all points in the State, the same as it is now giving its own subscribers. The order is to take effect September 15, 1909.

The order is the result of a long and bitter battle between the Pioneer interests and other companies operating within the State. The plaintiffs lodged a complaint before the Commission almost a year ago praying that this order be made, claiming that under the Constitution the Commission had such authority.

Section 5 of Article 9 of the Constitution provides that all telephone and telegraph companies operated for hire within the State shall transmit messages over each other's lines without discrimination.

The Commission gave the Pioneer company a very exhaustive hearing in this case and reopened the case several times to enable it to introduce additional evidence. It fought the physical connection provisions of the Constitution very stubbornly, declaring it an unreasonable and unjust requirement and that it would pave the way for more competition, and that the same would require them to expend a great deal of money to keep up the expensive toll lines with the extra business, and that the company could not get in return a fair and just compensation at the rates now charged for long-distance service. The Commission, in discussing the contention of the Pioneer company and construing the section of the Constitution relative to the physical connection provisions, says:

"The Commission can readily understand the force of the contentions of the defendent; yet it is evidentally the intention of the language of the Constitution that should any system establish a system of toll lines throughout the State, by the exclusive use of which its own exchanges or such exchanges as it may select, it would have the effect of giving it a complete monopoly of the telephone business in the State. That is to say, after a system of long-distance lines was once established, no other company would care to establish parallel lines in the State in competition with those already established, and for this reason it was doubtless provided in the constitution that a company should transmit another company's messages, which would have the effect of creating competition, at least in exchanges; that no one could afford to build a local telephone exchange in any town unless it owned a long-distance connection system of toll lines; and without the authority in the State to require this interchange of messages the defendant, so far as Oklahoma is concerned, would have a complete monopoly of all the business in the State."

There is an interesting bit of history connected with the dealings of the plaintiff and defendant in this case. The Pioneer company in 1905 purchased the Independent exchange of Pond Creek, agreeing to maintain the same rates as were then in effect, or 75 cents per month, to the 100 members of the exchange. In 1907 the company, after making some improvements, raised the rates to $1.50 per month, which brought about the organization of the present Grant County rural company which now has twice as many subscribers in Pond Creek at 50 cents per month as the Pioneer company. It has flourished in the past two years and has exchanges in all the other small towns in the county, with a network of rural lines throughout Grant and the adjoining counties. The farmers on the rural lines own their own telephones and pay but 25 cents per month. General Manager Sullivan, of the company, stated, upon the witness stand before the Commission, that the company was making money at this rate and was putting money into its sinking fund each year, and stated that they are contemplating organizing a similar company in Garfield and Logan counties within another year to compete with the Pioneer company.

Increased Use of the Independent Long-Distance in Buffalo.

A reduction in the long-distance rates to a number of important points was recently made by the Federal Telephone & Telegraph Company of Buffalo. Mr. B. G. Hubbell, president of the company, in speaking of the changes in rates, said:

"It has been our policy since organization to offer our long-distance service at the lowest rates at which good service can be sold, and in a recent investigation of the subject we have found it possible to make some material reductions in telephone charges to many important points.

"During the year our long-distance service has increased rapidly in volume; in fact, our June billing in Buffalo shows the marvelous increase of 24 per cent over the first months of this year, and because of this increasing volume of business offered us we are in a position to operate our long-distance lines at a decreased rate of expense.

"I assume the public, in its hurry soon forgets the rates

of long-distance messages before competition, and it might be interesting to look back and make some comparisons. The Buffalo-Jamestown rate before competition was 90 cents, now 20 cents; Buffalo-Rochester rate before competition, 75 cents, now 25 cents; Buffalo-Geneva $1 before competition, now 35 cents.

"There are hundreds of such comparisons which can be made which prove the wonderful saving to telephone users, due to the active competition which the Independent telephone companies have afforded in the past few years."

The Cuyahoga Telephone Company Establishes a Publicity Department.

The Cuyahoga Telephone Company of Cleveland, Ohio, has established a publicity department. The object of this department is explained in a letter which President E. G. Tillotson has sent to the stockholders of the company and which says in part:

"In order to keep the stockholders of this company in touch with their property and its affairs and also to obtain a closer affiliation with the subscribers of the company, the management has established a publicity department, and through it you will receive from time to time statements from the company."

Pioneer Company to Explain Why Rates Were Raised Without Permission of Corporation Commission.

The Oklahoma Corporation Commission has cited the Pioneer Telephone & Telegraph Company to appear before the Commission to show cause why it should not be fined for contempt on complaint that the company has raised telephone rates at Oklahoma City without obtaining the consent of the Commission.

Complaint was filed with the Commission by John Burrows of Oklahoma City stating that the rate which was put in effect on October 12, 1908, which was $3.75 a month, had been raised on June 1, 1909, by the company to $4.10, in violation of Order 101 of the Corporation Commission, which requires telephone companies not to make any change in rates without notifying the Corporation Commission.

City Attorney Twyford of Oklahoma City is fighting the increase in rates. The company claims to have 5,000 telephones in use in Oklahoma City and under its contract is entitled to a higher rate. Mr. Twyford declares that the company has not 5,000 telephones, claiming that over 1,000 of the telephones counted by the company are P B X extension telephones.

New Branch Exchanges in Columbus.

The Columbus Citizens Telephone Company, of Columbus, O., has about completed the plans and specifications for the four branch exchanges to be erected during the present season. Deals were closed recently by which the company came into possession of real estate in various sections of the city upon which the branch exchanges will be erected.

A number of new features have been introduced in the plans for the branch exchanges which the general manager G. R. Johnston and Roy Owens, superintendent of construction believe will better the plants and maintain a more even temperature. All the branches will be equipped with the automatic switches, and one of the objects to be obtained in the construction of the building is an even temperature. The contracts for the construction of the buildings will soon be awarded.

From the Patent Office

By Max W. Zabel

TELEPHONE ATTACHMENT.

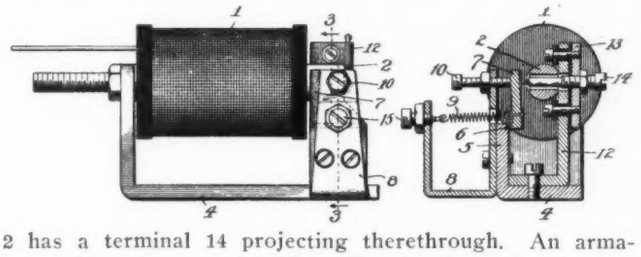
Howard Forde Hansell, Jr., Philadelphia, Pa., patent 929,128, July 27, 1909.

This invention contemplates mounting a bracket on the knuckle which usually supports the transmitter, and having one end of this bracket hold the transmitter and the other the receiver so that both hands are free while telephoning. Means are also provided to operate the switchhook lever as the receiver is placed to or removed from the ear.

RELAY.

F. R. McBerty, New Rochelle, N. Y., patent 929,319, July 27, 1909. Assigned to Western Electric Co. Chicago, Ill.

This relay consists of the relay 1 whose projecting core

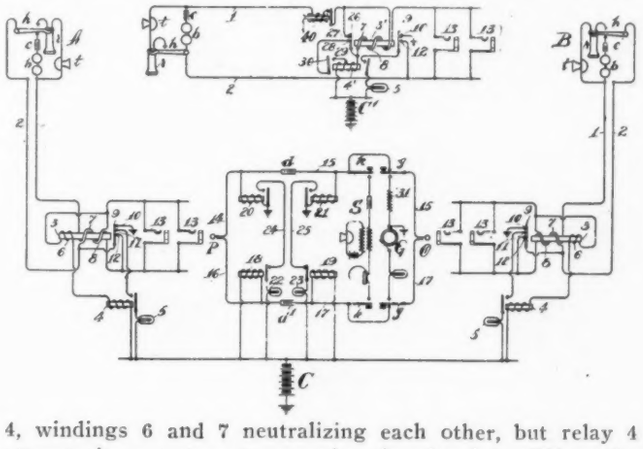


2 has a terminal 14 projecting therethrough. An armature 7 hinged at 6 and held in place by the spring 9 under the control of the adjusting screw 10 is mounted sidewise of the projecting core 2 and is attracted thereby to engage the contract terminal 14. It is claimed that this relay is very sensitive.

TELEPHONE SYSTEM.

Harry G. Webster, Chicago, Ill., patent 930,520, Aug. 10, 1909. Assigned to Milo G. Kellogg, Chicago, Ill.

This common battery system comprises a cut-off relay 3 which has three windings. When a subscriber initiates a call, current flows through windings 6 and 7 and the relay



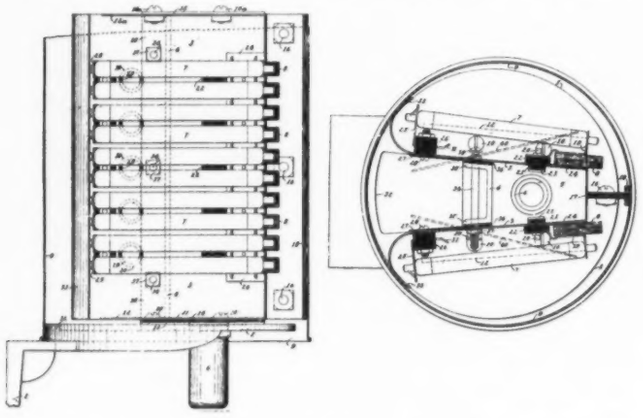
4, windings 6 and 7 neutralizing each other, but relay 4 attracts its armature to energize the signal 5. When the plug is inserted, additional circuit is provided through the relay 20, conductor 14, spring 13, the winding 6 and the relay 4 which thereby gives an unequal energization of relay 3, thus to draw off its armature. Thereupon an additional circuit is established through the relay 18 which

passes serially through the winding 8, windings 7 and 8 being twin windings and being so arranged as to be non-inductive to those currents. Winding 6 retains the relay 3 in attracted position.

CABLE TERMINAL.

Frank B. Cook, Chicago, Ill., patent 928,428, July 20, 1909.

This cable terminal consists of the pole bracket 2 upon which the channel 4 is supported carrying side members 3,



3 having arms which are held together by the bolt 16. When the screw 34 is released, these side members 3, 3 may be swung into the positions 40, 40 indicated by dotted lines, thus allowing access to the cable pairs which come through the openings 6. When the operations inside are completed, the apparatus is restored to normal as shown in the illustration. A circular can cover 9 is provided for protection against the weather.

SANITARY GUARD FOR TELEPHONES.

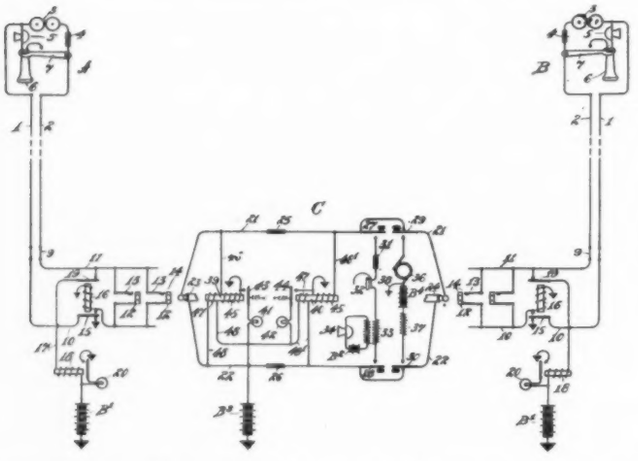
S. E. Florsheim, Chicago, Ill., patent 928,373, July 20, 1909.

This device consists of a guard constructed of electic material, which has the general outline of a transmitter mouthpiece, the bottom thereof having holes registering with those in the bottom of the mouthpiece. The device is adapted for placing within the transmitter mouthpiece and at the same time being adapted for collapsing so that it can be carried.

TELEPHONE EXCHANGE SYSTEM.

Harry G. Webster, Chicago, Ill., patent 930,515, Aug. 10, 1909. Assigned to Milo G. Kellogg, Chicago, Ill.

This common battery system consists of the ordinary



cut-off relay 16 and line relay 18, but has supervisory relays 40 and 45, each of which has two windings, one winding 45 being under the control of the operator's plug when inserting the plug in the jack to energize the supervisory signal 42, as there is a potential on the sleeve 12 which will cause a flow of current from the sleeve through plug 24, winding 45 to ground. The other winding 47 is under the control of the switchhook lever as is apparent from the illustration.

COIN BOX FOR TELEPHONES.

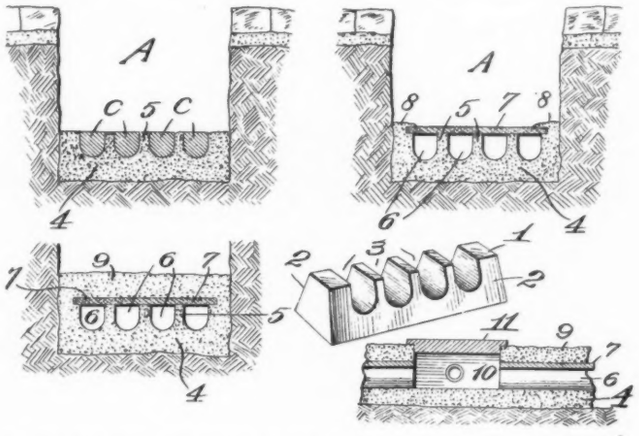
Charles S. Ellis, Chicago, Ill., patent 928,188, July 13, 1909. Assigned to American Coin Register Company, Chicago, Ill.

This coin box has an oscillating disk adapted to receive a coin when a subscriber is calling, which coin after being deposited, closes the circuit to the central station. If the desired connection is not obtained, current of a given polarity is sent out by the operator and the coin is returned. If however, the desired connection is obtained, current of opposite polarity is sent out so that the coin falls toward the coin box where it remains until another coin is deposited, when this first coin is released into the coin box. When this first coin is released into the coin box, it registers, thus making a record of the number of coins that enter the coin box.

UNDERGROUND CONDUIT.

Sylvester B. Way and Elisha C. Freeze, St. Louis, Mo., patent 928,826, July 20, 1909.

This manner of building underground conduit consists in constructing a number of concrete or cement molds 2, which are laid in place and then wooden strips *C* are laid upon these molds and concrete filled in and left to set, after



which the wooden strips *C* are withdrawn. Cement slabs are then laid on top and a covering 9 of concrete is provided to finish the duct.

WIRE ROPE CLAMP.

Clinton C. De Witt, St. Louis, Mo., patent 928,367, July 20, 1909.

This wire rope clamp is constructed in two halves held together by linked bolts in their place about the wire rope and a hook to which the hauling cable is attached is pivoted in one of the halves and has a cam-like surface engaging an inner movable member which presses against the wire rope as the hook is rotated by the hauling cable acting upon it.

TELEPHONE EXCHANGE SYSTEM.

Harry G. Webster, Chicago, Ill., patent 930,512, Aug. 10, 1909. Assigned to Milo G. Kellogg, Chicago, Ill.

In this system two clearing-out relays are used in the circuit, having contacts that have two operative positions besides the normal one, thereby controlling the local circuit of the supervisory signal. The relay has two armatures regulated by spring tension adjustment.

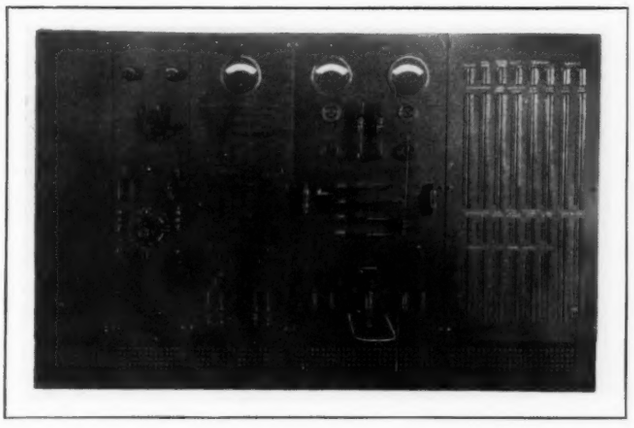
Factory and Sales

New Power Equipment for Minneapolis, Minn.

A new power board is being installed in the East Branch exchange of the Tri-State Telephone Company at Minneapolis, Minn. Having outgrown the switchboard which was installed in this exchange some eight years ago by the Stromberg-Carlson Telephone Manufacturing Company, an order was placed with the same firm for a complete new central office equipment of modern design and of sufficient capacity to serve the ultimate needs of this district. The new board has a frame capacity of 10,800 multiple lines, of which 2,000 lines are at present being installed.

The power board consists of five panels of Monson Maine slate, six feet in height, and together presenting a face eleven feet long. Charging current is derived from a mercury arc rectifier set, which is mounted upon one panel of the board, together with the associated motors, circuit breaker and other apparatus. A second panel is reserved for a duplicate rectifier set, which, it is expected, will be installed at a later date. As an emergency charging set, a generator belted to a gas engine was also provided. Batteries of the Westinghouse type 19-S-6 are to be used in the installation.

Upon the charging panel are the switches controlling two sets of batteries, and by means of which either set may be separately charged, discharged or floated; or both sets placed in parallel, as desired. Upon the latter panel are also mounted an overload and underload circuit breaker,

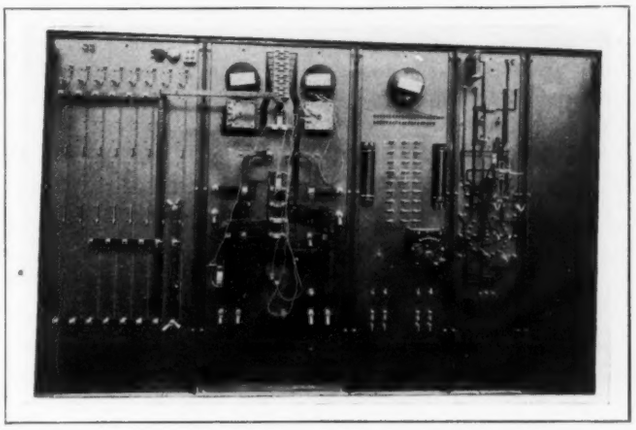


Front View of the New Minneapolis Power Board.

generator rheostat and a flush mounted ammeter and voltmeter. By means of the hand wheels located beneath the meters, these instruments may be placed upon either battery or charging circuit at will. A low reading voltmeter is also provided for cell test purposes, connection being obtained on any individual cell of battery by inserting a plug in one of the jacks below the meter. Beneath the cell test meter are the switches controlling the current from two Holtzer-Cabot ringing machines, which in addition to the ringing current are also equipped with "howler," "busy back" and "don't answer" attachments. At the bottom of this panel are the motor switches for these two ringing machines, one of which operates from the alternating service mains and the other from the forty-volt battery circuit.

All circuits in the distribution system throughout the exchange are separately fused on the fuse panel at the right of the board, each circuit being numbered according to function in such a manner that its location may be determined with ease. Fuses of the alarm type are employed and so wired that a pilot lamp is lighted above a distributing bar upon which a fuse has blown, as well as closing an alarm bell circuit.

The accompanying views taken just before shipment from the factory illustrate clearly the symmetrical and



Rear View Showing Arrangement of Apparatus and Wiring.

practical arrangement of the apparatus, and the general practice in power installations as followed by the Stromberg-Carlson Company.

Joseph W. Marsh, formerly vice-president and general manager of the Standard Underground Cable Company, Pittsburg, has been elected president of the company, succeeding the late Mark W. Watson. He will continue his duties as general manager. Mr. Marsh was also recently elected president of the Exchange National Bank of Pittsburg.

The Matthews' Cable Roller.

The accompanying illustration shows the use of the Matthews' cable roller, in a recent installation at Athens,

The Matthews' Cable Rollers in Action.

Ohio. The use of cable rollers in the stringing of aerial cable effects a great saving in time over ordinary methods, but more important than this is the fact that injury to the lead covering of the cable by the construction crew during installation is made practically impossible.

Automatic Electric Company's New Shop Superintendent.

Mr. William J. Tewksbury has accepted a position with the Automatic Electric Company of Chicago as general shop superintendent.

Mr. Tewksbury had eight years' experience as machinist, foreman and shop superintendent in the employ of the Diamond Sewing Machine Company, Adams & Westlake and the Chicago Stamping Company previous to 1895, when he entered the employ of the Western Electric Company, Chicago, in the telephone department. For ten years he was chief inspector of the entire output of the Chicago factory, and in 1908 he was made general foreman of the machine and assembling departments.

With the Automatic company, Mr. Tewksbury will have full charge of the mechanical end of manufacturing and inspecting the output. He is regarded as one of the most experienced and best equipped factory superintendents in the United States, and the Automatic Electric Company should be complimented on having secured his services.

Century Company's New Publication.

Under the name of the *Century Telephone News*, the August issue of a new journal devoted to the general welfare of Independent telephone properties has been put into the field. The journal is published in the interests of the Century Telephone Construction Company, of Buffalo, N. Y.

The paper will be published monthly and will contain articles on general and technical matters of interest to those engaged in telephone work. Incidentally, through this medium, the Century Telephone Construction Company will avail itself of the opportunity of acquainting the Independent telephone men with its line of telephone apparatus, which has been on the market for many years.

New Monarch Catalog.

Under the title "Magneto Switchboards," the Monarch Telephone Manufacturing Company, of Chicago, has recently issued a very tasteful and artistically illustrated catalog of 48 pages, illustrating and describing magneto switchboards, magneto apparatus and circuits.

The catalog is divided into sections giving in detail the different apparatus used on the switchboard, as follows: The drop and jack; combined ringers, drops and jacks; keys; plugs; operators' equipment; cord circuits; and general information. Other sections of the book treat of the direct current selective system; the apparatus required on sectional toll line switchboards; combined telephones and switchboards; wall type boards; 60, 120 and 200 line low type boards; the 100, 200, 300, 450 and 600 line floor type boards; toll boards; sectional toll boards and multiple boards.

In the back of the book a drawing is reproduced showing the lay out and principal dimensions of all the switchboards described.

The illustrations are very clear and with the descriptions given the reader is able to obtain a very clear conception of the various switchboards and apparatus used.

The Westinghouse Storage Battery Company.

The Westinghouse Storage Battery Company, which was incorporated July 12, has acquired all of the plant, patents and equipment of the storage battery department of the Westinghouse Machine Company and of the General Storage Battery Company, and will manufacture at Boonton, N. J., both the Westinghouse and Bijur types of storage battery for those classes of service in which each has proven superior. The Westinghouse Storage Battery Company enters the field with greatly increased manufacturing facilities and the best engineering talent obtainable, and will maintain thoroughly equipped testing and commercial laboratories, insuring uniformity of both materials and product. The general offices of the company will be located at Boonton, N. J., with sales offices in the principal cities of the country.

MR. T. W. WARNER, of Warner Pole Changer fame, who has more recently added to his laurels in the automobile manufacturing field and as police commissioner of Muncie, Ind., writes TELEPHONY from Rome, under date of July 31, stating that he will return to Muncie August 21, and at once commence work on a new plant.

THE NATIONAL POLE COMPANY, of Escanaba, Mich., is loading two train loads of poles at its Northern Minnesota yards, destined to Mississippi.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. O. P. NOAKES of Iola, Kan., has been secured as manager of the Humboldt, Kan., exchange, of the Humboldt Telephone Company.

MR. FOWLER BYNUM has purchased the Abner Telephone Exchange at Terrell, Tex. Mr. Bynum will make numerous improvements and will endeavor to give the people first-class service.

MR. H. E. McCAFFREY, who has been connected with the Wilmington Light, Power and Telephone Company for some time, is now connected with the D. & A. Telephone Company, at Wilmington, Del.

MR. W. R. BARKDULL, formerly traveling secretary of the Missouri Independent Telephone Association, on August 1st took the management of the Home Telephone Company of Cairo, Ill. This company operates exchanges at Mounds City, Mounds and Cairo and Mr. Barkdull will have a wide field to work in.

MR. LON LEE, who for over twelve years was manager of the Home Telephone Company of Champaign, Ill., has resigned his position to go into another line of work. All those with whom Mr. Lee came in contact in a business way regret having him leave the work. He is succeeded as manager by Mr. E. A. Dacey of Scranton, Pa.

MR. CHARLES B. LYNN has resigned his position as manager of the People's Home Telephone Company, of Leavenworth, Kan., to accept a similar position with the Independent Telephone Company at Atlanta, Ga. This gives Mr. Lynn a larger field to work in. Mr. Reed of Washington, D. C., has been chosen to fill the vacancy left by Mr. Lynn at Leavenworth.

NEW COMPANIES.

FORDYCE, ARK.—Articles of incorporation have been filed for a charter with a capital stock of $1,000,000, the new company to be known as the Southern Telephone Company. The purpose is to do a general telephone business. The incorporators are A. B. Banks, J. W. Lee, H. C. Couch, H. A. Longino, C. B. Lyle and T. A. Monroe.

BURLINGTON, N. D.—William J. Kluver, Henry Parrie, Daniel Baker and others are the incorporators of the Burlington Farmers Telephone Company. The company is capitalized at $25,000.

JAMESTOWN, N. D.—At a largely attended meeting held in Buchanan, the Buchanan Telephone Company was organized. Application will be made for a $25,000 charter. The officers chosen are: President, J. A. Buchanan; vice-president, James Lees; secretary, Edward Isaacs; treasurer, F. H. Keeler. The board of directors is as follows: James Lees, Edward Isaacs, S. R. Russell, N. J. McKenzie, John McGinnis, A. A. Gray, J. A. Buchanan, Orlo Hall, and F. H. Keeler. A local system at Buchanan with an exchange will be established as quickly as possible, and the same expedition will follow in the construction of lines west to Prairie—perhaps to Deer Lake; east to the vicinity of Fried P. O.; north about six or eight miles, and south about six miles with a line extending into Jamestown, or about 56 miles of line. The company will start with some 75 or more telephones. The construction is to be first class in every respect. Upwards of $3,000 of stock is subscribed, sufficient for preliminary work.

COWLINGTON, OKLA.—The Cowlington-Spiro Telephone Company was organized with $1,000 capital stock. The following officers were elected at a meeting of the stockholders. They are T. L. Thrael, of Cowlington, president; W. E. McGeown, secretary; R. L. Rewine, of Spiro, treasurer. The company is to operate rural lines between Cowlington and Spiro.

ONTARIO, ORE.—At a recent meeting of the Ontario citizens an Independent telephone company was organized. The company will be capitalized at $10,000. The reason this move was made was by a desire on the part of the citizens for better service. Members of the Boise Independent Telephone Company will be stockholders in the new company.

IRON RIDGE, WIS.—The Hubbard Telephone Company has been organized at this place with a capital stock of $2,000.

ELLISBORO, SASK., CAN.—The Ellisboro Rural Telephone Company has been incorporated with the head office here, for the purpose of building a rural telephone system.

FAIRVIEW, SASK., CAN.—The Fairview Farmers Rural Telephone Company has been incorporated under the laws of Saskatchewan with chief place of business in this town.

REGINA, SASK., CAN.—The Central Rural Telephone Company has been incorporated with head office in this city to build rural lines from here. The incorporators promise an early start on construction.

FINANCIAL.

DIX, ILL.—The Dix Telephone Company is considering increasing its capital stock to $25,000 and building an exchange at Gibson City.

BOONE, IA.—The semi-annual dividend of 6 per cent on preferred stock has been declared by the directors of the Boone County Telephone Company.

FRANCHISES.

ASHLAND, KY.—Under an order of the Fiscal Court a franchise was sold to the John Hazlett Telephone Company. The franchise was given for a period of twenty years.

WILMINGTON, OHIO.—C. E. Zahn who was recently granted a franchise for the operation of a telephone system in this place, is busy endeavoring to organize a Home telephone company. The company will be capitalized at $20,000. A two-story brick building will be erected for an exchange.

RUTLAND, VT.—In 1906 G. A. Clough was granted a charter for the Home Telephone Company for the operation of a system in this state. Now he is applying for a franchise to do business in this city. The company at present has about 200 miles of wire strung in Windsor, Washington and Rutland counties. It has a capital stock of $25,000 and the principal office is located at Randolph. Mr. Clough states that the company has twice as many subscribers in the counties mentioned as the competing company.

CONSTRUCTION.

PHOENIX, ARIZ.—John W. Foss, president and F. T. Alkaire, secretary-treasurer of the Home Telephone Company of Phoenix, have been traveling, visiting cities where the automatic system is employed. They visited the plants at Battle Creek, Lansing and Grand Rapids, Mich. The company is now ready to install its system but has not decided what system to use.

HIWASSEE, ARK.—The Hiwassee Telephone Company is completing preparations for the construction of its lines to Oravette, where an exchange will be installed.

ROSSVILLE, ILL.—The Rossville Telephone Company is at present installing 1,000 feet of underground cable, which does away with what overhead cables were still in use in the business district.

IRVING, KAN.—The city council has granted the Farmers' and Merchants' Telephone Company of Bigelow, permission to construct and operate a telephone system in this place.

MARINE CITY, MICH.—The Home Telephone Company is rapidly replacing its open wires with cable.

FLORENCE, NEB.—The Independent Telephone Company has purchased a lot and will soon erect a new exchange building.

ROME, N. Y.—James S. Brailey, Jr., who bid in the plant of the Rome Home Telephone Company, and E. L. Cline, both of Toledo, Ohio, were in the city recently looking over the system, and securing an estimate of cost for reconstructing it with a view of putting in an automatic switchboard which will accommodate at least 1,500 subscribers. They are prepared to furnish a superior service to many more subscribers than the system now has, which is between 1,100 and 1,200. It is expected the working gang will be here soon to reconstruct the system.

WALNUT SPRINGS, TEX.—The city is to have a modern common battery telephone system in operation by September 1. The Texas Central Telephone Company is already pushing the construction as rapidly as possible and assures the citizens that both service and equipment will be first class and that business will be solicited upon the merits of the service rendered. Walnut Springs now has two systems, the Southwestern company having been in operation for several years previous to this time.

PHILOMONT, VA.—Eugene Milhollen of this place is contemplating the erection of a modern metallic telephone line from Philomont and other towns in this section of the county to Aldie, to connect at that point with the lines of the Consolidated companies at Leesburg.

BROCKVILLE, ONT., CANADA.—At a meeting of representatives of the seven rural telephone lines in Leeds and Grenville counties it was decided to form a federation, with an exchange in the village of Athens.

ELECTIONS.

SPRING HILL, KAN.—W. C. Palmer has been chosen director to fill the vacancy caused by the resignation of D. W. Stuteville of the Mijo Telephone Company.

MAINE, MINN.—The Maine-Star Lake Telephone Company and the West Maine Telephone Company consolidated recently and elected the following officers: President, C. E. Bingham; vice-president, Chas. Johnson; secretary, H. O. Bjorklund; treasurer, Aug. Sandberg. Directors, A. L. Vogel, Peter Nygren and G. W. Halstead.

LACONIA, N. H.—The officers elected at the annual meeting of the Winnipesaukee Telephone Company are: President, Jaspar N. Heller; vice-president, Fred W. Storey; treasurer, Edmund S. Willard; secretary, S. S. Jewett. Directors, J. N. Keller, Fred W. Storey, Francis S. Huston, John B. Morrill, Chas. W. Vaughn, Wm. F. Knight, Nat B. Jones, Chas. W. Adams and Carl T. Keller. Executive Committee, J. N. Keller, Fred W. Storey and Wm. F. Knight. Following the business meeting, the officers left in automobiles for a tour of inspection of the exchanges in Franklin, Tilton, Belmont, Gilmanton and Alton.

PATERSON, N. J.—The following directors were elected at the annual meeting of the stockholders of the Paterson, Passaic and Suburban Telephone Company, held recently: Geo. A. Post, J. W. Lindsay, and Wayne Dumont of Paterson; B. G. Hamill, R. P. Wilson, B. Gummere, Jr., W. S. Hancock, E. C. Stokes, H. R. Schwartz, C. W. Rice, R. C. Chamberlin, F. R. Demarest of Trenton; R. Morrell of Passaic. The officers of the company are: H. R. Schwartz of Trenton, treasurer; J. W. Lindsay of Paterson, secretary.

HARRISBURG, PA.—The board of directors of the West Shore Telephone Company held an important meeting in the offices of the company recently. The following officers were elected: Hon. Ellis L. Orvis, Bellefonte, president; Jacob Reiff, New Cumberland, vice-president; Ernest H. Greenwood, Camp Hill, secretary and treasurer. The directors are Dr. J. C. Stem, Lemoyne, chairman; C. S. Willis, Lemoyne; Jacob Reiff, New Cumberland; S. S. Rupp, Shiresmantown; Ernest H. Greenwood, Camp Hill. Mr. Greenwood announced that the switchboard and all the central station apparatus had arrived and that the switchboard installation gang would begin work immediately. As soon as the switchboard is installed all present subscribers will be cut in to the West Shore exchange and the business handled over the present lines until the cable lines are completed.

MISCELLANEOUS.

DECATUR, ILL.—Reports from this city show a very rapid and steady growth in the business of the Decatur Home Telephone Company. Since the introduction of the automatic system recently, over three hundred names have been added to the list, and the list is still growing rapidly.

QUINCY, ILL.—The city officials are again making an attempt to force the telephone company in this city to place its wires in the down town section underground. Several times this has been attempted but the ordinance has not as yet been passed.

GREENTOWN, IND.—The Greentown Telephone Exchange was recently sold by W. L. Bott of Star City to J. T. Deschon of New Richmond. The deal includes the local exchange and all farmers' lines connected. The new owner owns other telephone property and contemplates adding some more improvements to the Greentown exchange.

MECKINOCK, N. D.—The exchange equipment of the Meckinock Rural Telephone Company was completely destroyed by fire recently, caused by lightning striking the building.

GUTHRIE, OKLA.—The Oklahoma Corporation Commission, following out the provisions of its general order issued several months ago holding "A telephone in a depot where an exchange is operated in the town is a necessary and essential part of the railroad equipment for the traveling public," is issuing orders to the various Oklahoma railroads requiring them to install telephones in depots. This move was made on complaint filed with the Commission by citizens.

NEW BEDFORD, PA.—The New Bedford Telephone Company reports a healthy growth at its Pulaski exchange, which was opened for business a little over a year ago.

COLUMBIA, S. C.—The Enoree Telephone Company has asked the Railroad Commission for permission to increase its rates for telephones and telephone service. The Commission sent the president of the company a copy of its thirteenth annual report, which prescribes the manner of procedure in instances where telephone companies wish to increase their rates. No increase of rates can be made without the permission of the Commission.

CLASSIFIED ADVERTISEMENTS—THE GREAT "WANTED" AND "FOR SALE" MEDIUM

RATES: 5 cents a word, with minimum charge of $1.00 cash should accompany all transient advertising.

FOR SALE OR TRADE—320 acres of fine farming land, unencumbered; will take prosperous telephone plant in exchange. Address, with particulars, 683, TELEPHONY, Chicago.

WANTED—A telephone exchange, worth $50,000 to $100,000. I have several thousand acres of land in Minnesota within 100 miles of St. Paul and Minneapolis, which I will trade for a good, clear, unincumbered telephone exchange or exchanges, with toll and rural lines. Prefer to get a system within 500 miles of Chicago. E. L. Wortham, care of Wellington Hotel, Chicago, Ill.

FOR SALE—Telephone exchange in northeast Mo. town of 600 inhabitants. Everything in good condition. Address, 696, care TELEPHONY.

FOR SALE—Good-sized telephone plant in fine condition and earning handsome dividends. Have too many interests to give this proposition attention it deserves. 679, TELEPHONY, Chicago.

FOR SALE—Telephone Exchange in town of 2,000 people; growing very rapidly—an ideal place to live—everything new and up-to-date construction. 35 miles toll line. Address J. A. Frisby, Conway, Ark.

WANTED—Five Troublemen familiar with Strowger automatic equipment; also five switchmen, one capable of managing switchroom. Location Central West. Address answers 692, care TELEPHONY.

WANTED—Manager for telephone plant in a town of 5,000 inhabitants. System includes good Long Distance Copper lines, and doing a big business. Located in Nebraska. Must invest at least $5,000. This proposition bears the closest inspection. Salary, $1,800 a year, to the right man. Address, 694, care TELEPHONY.

WANTED—Good all 'round telephone man, with experience both in common battery and magneto work (Western Electric apparatus), to take charge of operating and maintenance end of company having three exchanges, with approximately 500 stations connected and 150 miles toll lines. Applicant, to receive consideration, must know the business thoroughly from the ground up, including switchboard and framework, and be a man who is sober and reliable and can be depended upon to work in any capacity where necessity requires. State salary expected and references in first letter. Address 687, care TELEPHONY.

WANTED—Position by telephone man experienced as wire chief and manager. Can deliver the goods. 681, TELEPHONY, Chicago.

WANTED—A first-class Magneto troubleman is seeking a position with an Independent Company. Address 685, care TELEPHONY.

WANTED—Position by young man in any outside capacity. Five years' experience in all kinds of construction work and as foreman. Address 680, TELEPHONY, Chicago.

CABLEMAN—If in need of an experienced cableman, write me. Can install complete cable plants. Splice and locate troubles with the Bridge. References. Address, Cableman, 181 W. 101st St., New York, N. Y.

WANTED—The present address of one Lloyd E. Knapp. Last address known—Binz Bldg., Houston, Tex. Any information that can be given as to present whereabouts of this individual will be greatly appreciated. Address, Swedish-American Telo. Co., Chicago.

WANTED—Second hand switchboard self restoring drops 200 to 400 numbers. Address 684, care TELEPHONY.

FOR SALE—1000 line Magneto Multiple Switchboard in good repair. For further information address: Home Telo. Company, St. Joseph, Mo.

FOR SALE—100 nearly new central energy Kellogg wall phones, $4.75 in lots of ten or more while they last. W. W. Holliday, Jacksonville, Ill.

FOR SALE—Some second-hand Stromberg-Carlson magneto series telephones. Cheap—long type, narrow battery box. Home Telephone Company, Elkhart, Ind.

FOR SALE—Bargain, nearly new, 220 Stromberg-Carlson Visual Signal switchboard. Good condition. Good selling reasons. Make offer today. Home Telephone Company, Waverly, Ohio.

FOR SALE—1,500 new and second-hand No. 7 Baird Registers. These registers are in first-class and new condition and can be shipped immediately. Make an offer. G. L. Davis, 164 N. Second St., Salt Lake City, Utah.

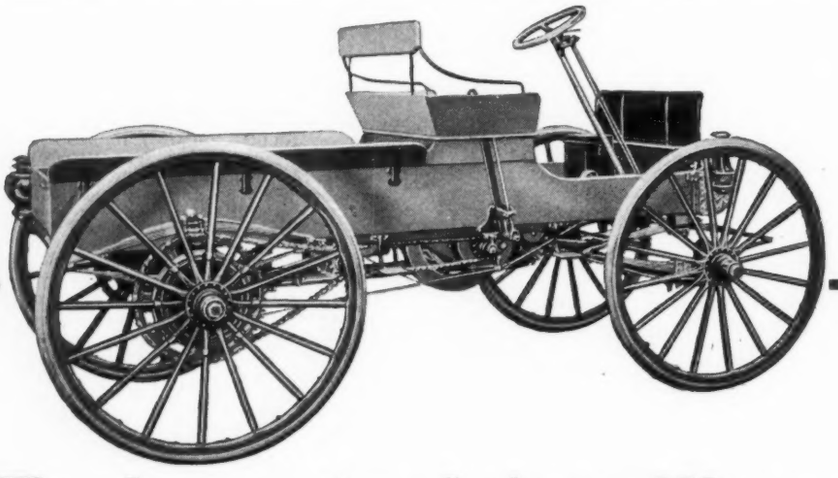
FOR SALE—Several hundred new hand telephones with bell boxes, complete, for central energy system, high grade construction. Write for bargain prices. Catalogue and sample instrument to reliable parties. Address, Manufacturer, care TELEPHONY.

CHEMICAL ENGRAVED NAME PLATES and drop numbers. Steel stamped letters and figures. Send for samples and prices. C. H. Hanson, 44 Clark St., Chicago.

WILL SELL OR TRADE PATENT on the best GUY ANCHOR made, cheaply manufactured, has undisputed merits, hundreds in use and giving perfect satisfaction. Sale includes full set of patterns. Address 676, care TELEPHONY.

"CABLE FARM AND TOLL LINE TROUBLE" located with an Electro Magnetic Tester. Locates to exact spot. No measurements. Circuits and instructions $2.00. No special material required. Electro-Magnetic Cable Tester Co., 389½ Selby Ave., St. Paul, Minn.

THE PERFECTION WRENCH—The wrench that holds. The newest and best wrench made. All steel. Great strength. Instantly adjusted. Positive grip. Saves you time and temper. Cannot slip when once adjusted. Indispensable to automobilists, linemen, machinists and all other mechanics. Best "all 'round" tool ever offered for sale. For circular, address: The Perfection Wrench Co., Box 499X, Port Chester, N. Y.



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